

حمل الآن

مجانا وحصريا

المراجعة رقم (1)

الترم الثاني



Pony Revision on Unit 1 – Lesson 1

Metals and Nonmetals

First Week

1 Complete the following sentences:

1. The outermost energy level of metals contains four electrons, while that of nonmetals contains four electrons.
2. Element (A), with its outermost energy level (M) containing two electrons, is a, while element (B), with its outermost energy level (L) containing six electrons, is a
3. All metals are solids, except for, which is a liquid.
4. All nonmetals are bad conductors of electricity, except for, which is a good conductor of electricity.
5. Some nonmetals are solid materials, such as; gaseous materials, such as; and the only liquid is
6. The atoms of solid metals are arranged in a structure known as
7. The metallic bond is formed due to the attraction between the positive of a metal and the cloud of valence negative surrounding it.
8. The bronze alloy is composed of at 5% and at 95%.
9. The bronze alloy is used in manufacturing and
10. The bronze alloy is characterized by being than copper and to rust.

2 Cross out the odd word, and then write the relation between the remaining words:

1. Gold – Silver – Bromine – Mercury (.....)
.....
2. Phosphorus – Bromine – Mercury – Sulfur (.....)
.....
3. Graphite – Bromine – Phosphorus – Sulfur (.....)
.....
4. Iodine – Sulfur – Carbon – Hydrogen (.....)
.....
5. Bronze – Chlorine – Copper – Tin (.....)
.....



3 How do you differentiate between each of the following:

1. Phosphorus and iron, in terms of:

a. Metallic luster

b. Malleable and ductile

c. Conductivity of heat and electricity

d. Melting point

P.O.C	Phosphorus	Iron
a. Metallic luster		
b. Malleable and ductile		
c. Conductivity of heat and electricity		
d. Melting point		

2. Sodium and graphite, in terms of:

a. Metallic luster

b. Which one is opaque

P.O.C	Sodium	Graphite
a. Metallic luster		
b. Which one is opaque?		

3. Sulfur and copper, in terms of:

a. Malleable and ductile

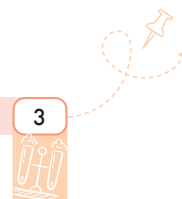
b. Which one is more brittle?

P.O.C	Sulfur	Copper
a. Malleable and ductile		
b. Which one is more brittle?		

4. Silver and phosphorus, in terms of:

Conductivity of electric current

P.O.C	Silver	Phosphorus
Conductivity of electric current		





4 What is meant by each one of the following:

1. Metallic bond

.....

.....

2. Alloy

.....

3. Recycling

.....

.....

5 What is the benefit of recycling metal wastes?

.....

.....

6 If elements (A & B) have melting points of (1538 & 115.21) respectively, answer the following questions:

1. What is the type of each one of them? And why?

.....

.....

2. Which one of them is malleable and ductile?

.....

7 What happens if

1. We knock on a piece of graphite?

.....

.....

2. We increase the number of valence electrons in the metal atoms according to the metallic bond?

.....

3. We mix molten gold with molten copper?

.....





8 Give reasons for the following:

1. Calcium ($_{20}\text{Ca}$) is a metal, while Chlorine ($_{17}\text{Cl}$) is a nonmetal.

.....

.....

.....

2. Carbon is used in the manufacture of dry cells although it is a nonmetal.

.....

.....

.....

3. Calcium ($_{20}\text{Ca}$) is harder than sodium ($_{11}\text{Na}$).

.....

.....

.....

4. A bronze alloy is used in the manufacture of medals instead of copper.

.....

.....

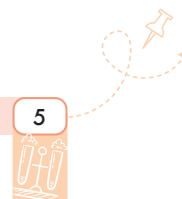
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9 Complete the following table that shows some materials & their properties.

You can choose the color from the following words bank:

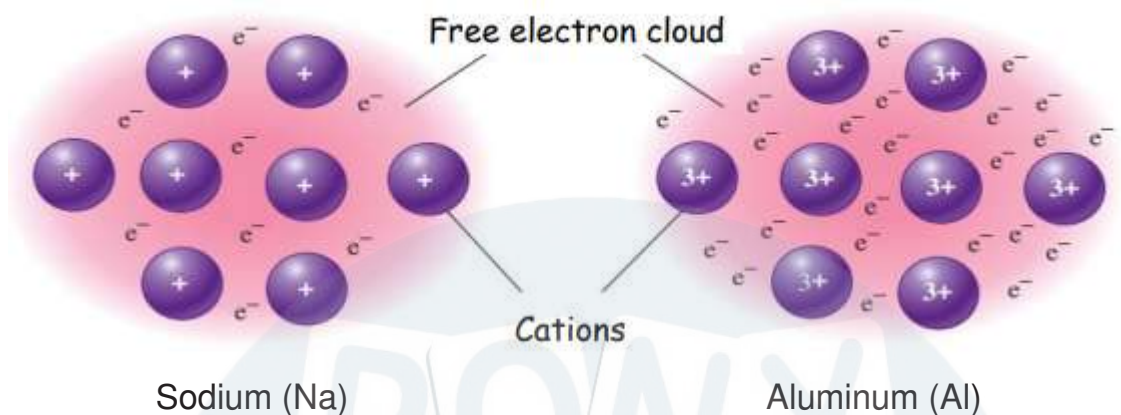
(Black - Colorless - Yellow - Waxy white - Silver - Red)

Element	Type	Physical State	Electric Conductivity	Color
1- Oxygen				
2- Gold				
3- Carbon				
4- Bromine				
5- Nitrogen				
6- Mercury				
7- Phosphorus				





10 The following figure shows a bond between two different elements:



1. What are the types of the two elements in the figure? And why?

.....

..... سلسلة كتب الأستاذ

.....

2. What is the valency of each?

.....

.....

3. What is the type of bond in both of them?

.....

4. Which is stronger in terms of the bond? And why?

.....

.....

.....



1 Complete the following sentences:

1. The scientist clarified that acids are substances that dissolve in water and produce, while bases, when dissolved in water, produce
2. The molecular formula of the carbonate group is, while the molecular formula of the sulphate group is
3. Oxygenated acids are those that contain element, such as and
4. Non-oxygenated acids don't contain element, such as and سلسلة كتب الاستاذ
5. The number of hydrogen atoms in an acid molecule is equal to the charge of the that forms it.
6. The number of hydroxide groups in a base molecule equals the charge of the that forms it.
7. Lactic acid provides the muscles with during a lack of oxygen, and its accumulation in the muscles causes
8. The molecular formula of acids starts with a positive cation, and their names are associated with the in their composition.
9. The molecular formula of alkalis (bases) ends with a, and their names are associated with the in their composition.
10. The molecular formula of alkalis (bases) that contain a cation Ca^{2+} is
11. The total charge of molecules of any compound equals
12. The stomach secretes acid, which helps in
13. Lemon and ketchup are considered substances, while toothpaste and baking soda are considered substances.
14. When hydrochloric acid dissolves in water, it produces a ion and a ion.



15. When magnesium hydroxide dissolves in water, it forms a ion and a ion.
16. Acids react with alkalis to form and
17. Nitric acid is considered from acids, while nitrous acid and sulfurous acid are considered from acids.
18. Metals burn in the presence of oxygen gas, forming, and most of them are known as oxides.
19. Nonmetals burn in the presence of oxygen gas, forming, and most of them are known as oxides.
20. The dissolution of sulphur trioxide (SO_3) in water forms
21. Dissolving in water forms magnesium hydroxide.
22. The combustion of fossil fuels produces oxides of and

2 How to differentiate between:

1. The bicarbonate group and the sulphate group, in terms of the number of charges they carry - the molecular formula.

P.O.C	Bicarbonate group	Sulphate group
a. The number of charges they carry		
b. The molecular formula		

2. Sulphuric acid and calcium hydroxide, in terms of the molecular formula.

P.O.C	Sulphuric acid	Calcium hydroxide
The molecular formula		

3. Sulphurous acid and sulphuric acid, in terms of the molecular formula.

P.O.C	Sulphurous acid	Sulphuric acid
The molecular formula		

4. Acidic oxides and basic oxides,
according to the definition - the result of their dissolution in water.

P.O.C	Acidic oxides	Basic oxides
a. Definition		
b. The result of their dissolution in water		

5. Sulphurous acid and sulphuric acid,
according to the molecular formula - strength and weakness.

P.O.C	Sulphurous acid	Sulphuric acid
a. The molecular formula		
b. Strength and weakness		

3 Give one example of each of the following:

- A positive atomic group.
.....
- A non-oxygenated acid that forms an anion in a liquid state.
.....
سلسلة كتب الأستاذ
- An acid secreted by the stomach.
.....
- An oxygenated acid that carries three negative charges.
.....
- An acid secreted by the muscles.
.....
- A weak acid.
.....
- A strong acid.
.....



8. A strong alkali.

.....

9. A weak alkali.

.....

10. A metallic oxide.

.....

11. A non-metallic oxide.

.....

4 Write the chemical formula for the following compounds:

1. Hydrosulphuric acid (.....)

2. Hydrobromic acid (.....)

3. Sulphurous acid (.....)

4. Phosphoric acid (.....)

5. Ammonium hydroxide (.....)

6. Hydrochloric acid (.....)

7. Sulphuric acid (.....)

8. Nitric acid (.....)

9. Potassium hydroxide (.....)

10. An atomic group consisting of three elements (.....)

11. Nitrous acid (.....)

5 Write the names of the following chemical compounds and state their type:

1. H_2SO_4 (.....) (.....)

2. H_2CO_3 (.....) (.....)

3. HCl (.....) (.....)

4. HNO_2 (.....) (.....)

5. MgO (.....) (.....)

6. SO_3 (.....) (.....)

7. $Mg(OH)_2$ (.....) (.....)



8. H_2S (.....) (.....)

9. H_3PO_4 (.....) (.....)

10. $NaCl$ (.....) (.....)

6 What is meant by each of the following:

1. Atomic group

.....
.....

2. Acids

.....
.....

3. Alkalis

.....
.....

4. Acidic oxides

.....
.....

5. Basic oxides

.....
.....

6. Acid rains

.....
.....

7 What is the benefit of each of the following:

1. Stomach acid

.....
.....

2. Lactic acid

.....
.....

3. Milk of magnesia

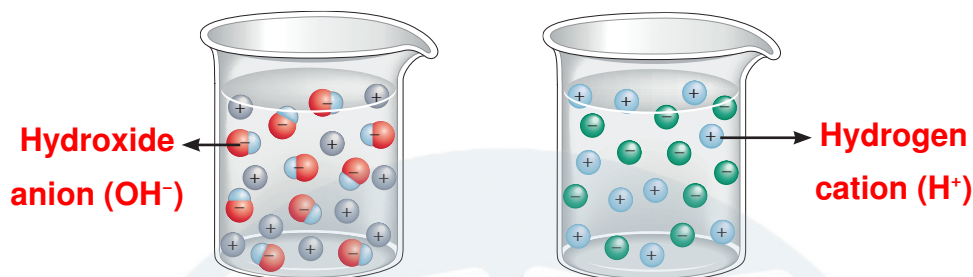
.....
.....

4. Litmus paper

.....
.....

8 Study the following figures, and then answer the questions below:

The two figures show two compounds, one alkaline and the other acidic.



- Which is acidic and which is alkaline?
- Which of them results from the dissolution of a nonmetal and which results from the dissolution of a metal?
- What is the result of adding the first tube to the second tube?
- How do you differentiate between them with a litmus strip?

9 Study the following figures, and then answer the questions below:

The two opposite figures show two alkali compounds, which are sodium hydroxide and ammonium hydroxide.

- Write the chemical formula for each of them.

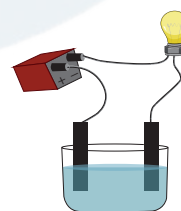


Figure 1

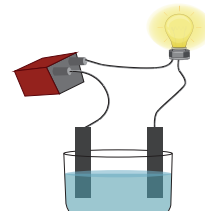


Figure 2

- Which one of them is weakly alkaline? And why?
- Which one of the two figures represents (NaOH)?

10 Study the following figures, and then answer the questions below:

The two figures show the combustion of two elements:



**Combustion of a
magnesium ribbon**



**Combustion of sulphur
crystals**

1. Which is a metal and which is a nonmetal?
.....
2. What is the result of combustion of each of them?
.....
.....
.....
3. How do we differentiate between them through practical experience?
.....
.....
.....

11 Give reasons for the following:

1. Acids turn the blue litmus paper into red.
.....
2. Alkalis turn the red litmus paper into blue.
.....
3. Milk of magnesia is used to treat stomach acidity.
.....



12 What happens when:

1. An electric current passes through sulphuric acid and acetic acid, according to the lighting of the lamp?
.....
.....
.....
2. Acids are mixed with alkalis?
.....
3. You heat a piece of magnesium, and then add water to the product?
.....
.....
4. You heat a piece of sulphur?
.....
5. You add water to the previous product?
.....
6. You put a blue litmus paper in the previous solution?
.....
7. Sulphur oxide is dissolved in rain water?
.....

13 Mention the damages caused by acid rains.

.....

.....

.....

.....



Pony Revision on Unit 1 – Lesson 3

Chemical Indicators and Salts

Fourth Week

1 Complete the following sentences:

- are chemical substances that change their color in an acidic medium compared to a basic medium, such as
- Distilled water has a neutral effect and does not change the color of the litmus strip due to the equal number of ions with ions.
- There are many indicators, such as litmus strip and
- We reduce soil acidity by adding materials, such as
- The pH value of acids is than 7, while the pH value of is greater than 7.
- The pH value of a table salt solution (sodium chloride) is
- The pH value is accurately measured by using a device called
- Acidic gases include and
- Basic gases include
- Neutral gases, which do not affect a litmus strip, include and

2 Cross out the odd word, and then write the relation between the remaining words:

- Universal indicator strips – Litmus paper – Voltmeter – pH meter
(.....)
- $N_2 - H_2O - H_2 - HCl$
(.....)
- $SO_2 - Cl_2 - CO_2 - NH_3$
(.....)
- $HNO_3 - H_2SO_4 - H_2O - HCl$
(.....)

**3 How do you differentiate between each of the following:****1. Distilled water and hydrochloric acid in two ways**

P.O.C	Distilled water	Hydrochloric acid
a. By litmus indicator		
b. By pH meter		

2. CO₂ and O₂ gases

P.O.C	CO ₂	O ₂
a. By a wet litmus strip	سلسلة كتب الاستاذ ..... .....	..... .....

3. Ammonia gas and nitrogen dioxide gas

P.O.C	Ammonia gas	Nitrogen dioxide
a. By a wet litmus strip		

4 Give one example of each of the following:

1. A gas that turns the blue litmus strip into red.
2. A gas that turns the red litmus strip into blue.
3. A gas that has a neutral effect on the litmus paper.
4. A chemical indicator that measures the pH accurately.

5 What is meant by each one of the following:**1. Indicators**

.....
.....



2. Universal indicator

.....

.....

.....

3. pH value

.....

.....

6 Answer the following questions:

1. If you have nitric acid and nitrous acid:

1 Write their molecular formula.

.....

2 Which one is strong and which one is weak?

.....

3 How do you differentiate between them?

.....

.....

2. If you have two compounds (A) & (B) and their pH values are (8.5 and 3) respectively:

1 Determine the type of each one.

.....

.....

2 What happens when you mix them together?

.....

7 Give reasons for the following:

1. Litmus paper is not suitable for distinguishing between strong and weak acids.

.....

2. Litmus paper doesn't affect distilled water.

.....

.....



3. Nitric acid turns the blue litmus paper into red.

.....

4. Calcium hydroxide turns the red litmus paper into blue.

.....

8 What happens in each one of the following:

1. You put a piece of sugar in a test tube containing sulphuric acid?

.....

2. You place two red and blue litmus strips in a tube of hydrogen gas?

.....

3. You place two red and blue litmus strips in a tube containing chlorine gas?

سلسلة كتب الاستاذ

.....

4. You place two red and blue litmus strips in a tube containing carbon dioxide gas?

.....

.....

5. You place two red and blue litmus strips in a tube containing ammonia gas?

سلسلة كتب الاستاذ

.....

.....

6. You add calcium hydroxide to acidic soil?

.....

.....



Pony Revision on Unit 2

Energy and Its Applications

Sixth and
Seventh Weeks

1 Complete the following sentences:

Lesson 1: Potential Energy

- and are the measuring units of distance and displacement.
- and are the measuring units of speed.
- Speed =
- is the measuring unit of work, while newton is the measuring unit of
- = Force $\times$ Displacement
- The factors affecting potential energy are and
- is the measuring unit of weight.
- Five kilometers = meters, while three kilojoules = joules.

Lesson 2: Kinetic Energy

- The factors affecting the kinetic energy of an object are and
- The measuring unit of kinetic energy is and is equal to
- The kinetic energy of an object =
- Kinetic energy is proportional to mass and
- The more the mass of the object, the the speed when the kinetic energy is constant.
- If the speed of the body increases into three times, its kinetic energy increases into times of its value.

2 Choose from columns (B) and (C) what suits column (A):

Lesson 1: Potential Energy

Column (A)	Column (B)	Column (C)
1. Work	1. m/s	1. $w \times h$
2. Potential energy	2. N	2. $F \times s$
3. Weight	3. J	3. $m \times g$
4. Speed	4. N.m	4. $d \div t$
1. 2. 3. 4.		

**3 Complete the following table:****Lesson 2: Kinetic Energy**

Number	Kinetic Energy (KE) (Joules)	Speed (v) (m/s)	Mass (m) (kg)
(1)	.....	8	2
(2)	48	4	.....
(3)	96	.....	6

4 Compare between:**Lesson 2: Kinetic Energy**

Kinetic energy and potential energy in terms of:

Definition – mathematical relationship – affecting factors

Device	Kinetic Energy	Potential Energy
a. Definition		
b. Mathematical Relationship		
c. Affecting Factors		

5 What is meant by each of the following?**Lesson 1: Potential Energy**

1. Movement path.

.....

2. Distance.

.....

.....

3. Displacement.

.....

.....



4. Speed.

.....

5. Work.

.....

6. Energy.

.....

7. Potential energy.

.....

8. The independent variable.

.....

9. The dependent variable. سلسلة كتب الاستاذ

.....

10. Controlled variables.

.....

.....

Lesson 2: Kinetic Energy

11. Kinetic energy. سلسلة كتب الاستاذ

.....

.....

.....

6 What is meant by:

Lesson 1: Potential Energy

1. The distance traveled by an object is 50 meters.

.....

.....

2. The displacement of a body is 30 meters.

.....

.....



3. A body's speed is 120 km/h.

.....

4. A moving car travels 720 meters in two minutes.

.....

.....

5. The potential energy of a body is 60 joules.

.....

.....

6. The energy stored in a body as a result of the work done is 0.5 kilojoules.

.....

Lesson 2: Kinetic Energy

7. The kinetic energy of an object is 250 joules.

.....

.....

7 What happens when:

Lesson 2: Kinetic Energy

1. The speed of a moving object increases into the double with a constant mass, according to its kinetic energy?

.....

2. The mass is doubled and the speed is decreased to half, according to the kinetic energy?

.....

3. Two cars, (1) and (2), move at different speeds and have the same mass, according to the kinetic energy?

.....

8 When will the following happen?

Lesson 1: Potential Energy

1. The speed is equal to zero.

.....



2. The work is equal to zero.

.....

.....

.....

3. The potential energy equals zero.

.....

.....

4. The distance equals the displacement.

.....

5. The speed equals the distance.

.....

Lesson 2: Kinetic Energy

6. The kinetic energy = zero.

.....

7. The kinetic energy is numerically equal twice the mass of the body.

.....

9 Give reasons for:

Lesson 1: Potential Energy

1. The work done by a car is less than the work done by a truck, even though their speeds are equal.

.....

.....

2. The work required to stop a moving car at a high speed increases.

.....

.....

Lesson 2: Kinetic Energy

3. The kinetic energy of the car decreases when the driver presses the car's brakes.

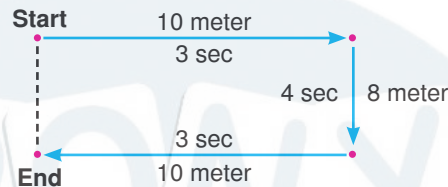
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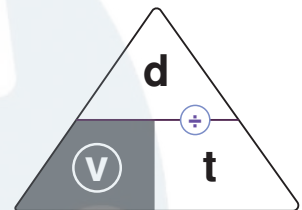
10 Problems:

Lesson 1: Potential Energy

- A body moves 10 meters east in 3 seconds, then moves 8 meters south in 4 seconds, then moves 10 meters west in 3 seconds. Calculate:
 - Total distance
 - Displacement
 - Body speed

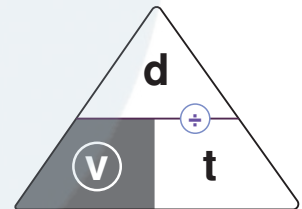


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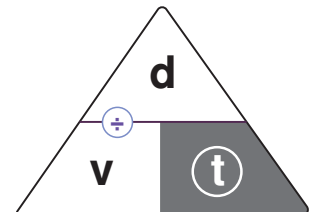
- Calculate the speed of a body that covered a distance of 50 km in two hours.

-
-
-



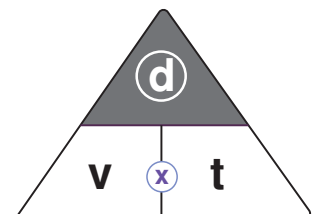
- Calculate the time required to cover a distance of 300 meters if the body is moving at a speed of 20 m/s.

-
-
-



- If a body moves at a speed of 20 km/h, calculate the distance traveled after three hours.

-
-
-

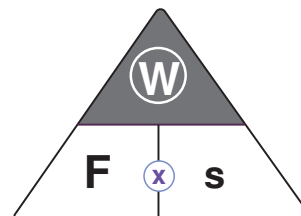


5. A person pushed an object with a force of 40 Newtons and it moved in a straight line a distance of 10 meters. Calculate the amount of work done.

.....

.....

.....

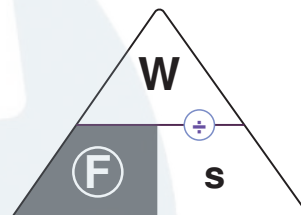


6. A body does work of 50 joules to move a bicycle a distance of 10 meters. Calculate the amount of force required to do the work.

.....

.....

.....

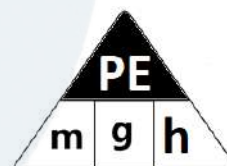


7. Calculate the potential energy of a body with a mass of 15 kg at a height of 150 cm, knowing that the acceleration due to gravity is 10 Newton/kg.

.....

.....

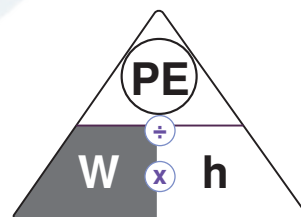
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8. If a body has a potential energy of 240 joules at a height of 12 meters, calculate the weight of the body.

.....

.....



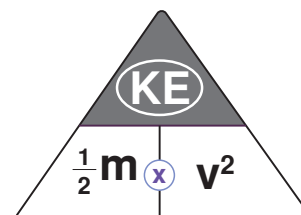
Lesson 2: Kinetic Energy

9. Calculate the kinetic energy of a ball with a mass of 20 kg moving at a speed of 4 m/s.

.....

.....

.....





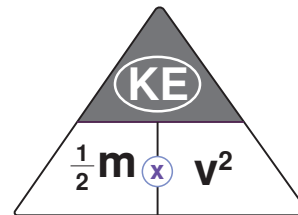
10. Calculate the kinetic energy of a body weighing 20 Newtons moving at a speed of 6 m/s.

.....

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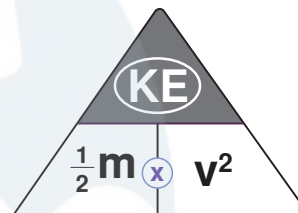
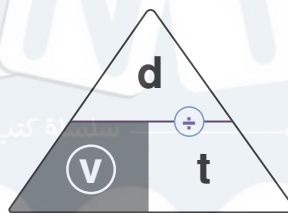
11. Calculate the kinetic energy of a body with a mass of 500 g that travels 20 meters in 4 seconds.

.....

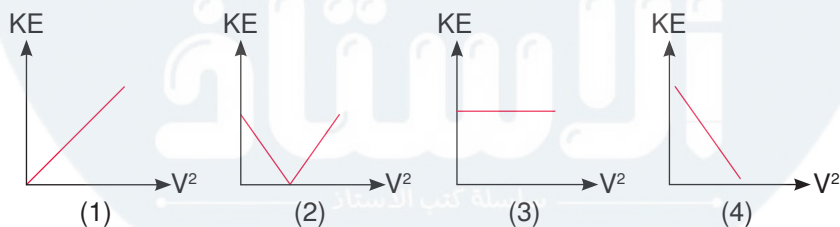
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12. The following figures show the relationship between kinetic energy and velocity when the mass is constant. Determine which of them represents:



1. Its kinetic energy increases.
2. Its kinetic energy decreases.
3. Its kinetic energy remains constant.

(.....)

(.....)

(.....)



Pony Revision on Unit 3 – Lesson 1

Nutritional Relationship in Biological Communities

Eighth and
Ninth Weeks

1 Complete the following sentences:

1. The ecosystem consists of and
2. There are non-living components in the ecosystem, such as
and
3. The ecosystem consists of several levels: the individual,,
and
4. is considered the basic unit in the classification of living
organisms.
5. is the individual that benefits from commensalism.
6. is the one that is neither benefited nor harmed in commensalism.
7. Each stage in which energy is transferred in the food chain is called
.....
8. The rabbit and the horse are considered because they have
..... for cutting plants.
9. Carnivorous animals, such as and, are characterized
by having sharp canines to their prey.
10. Omnivorous animals, such as and, feed on
both meat and plants.
11. Hyenas and vultures are considered as they feed on the
remains of dead organisms.

2 What is meant by each of the following?

1. Ecosystem

.....
.....

2. Biocommunity

.....
.....

3. The individual

.....



4. Predation

.....

.....

5. Competition

.....

.....

.....

6. Mutualism

.....

.....

7. Commensalism

.....

.....

.....

8. Decomposers

.....

.....

9. Food chain

.....

.....

10. Food web

.....

.....

11. Energy pyramid

.....

.....

12. Biological control

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.....

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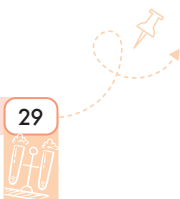


3 Mention the type of food relationship in each of the following:

1. The remora fish that sticks to the shark's body and gets its food remains without affecting the shark. (.....)
2. Falcons hunt mice. (.....)
3. The trees in the forest are densely packed together, blocking light from the short trees. (.....)
4. Spiders hunt insects. (.....)
5. Algae live inside the coral tissues and carry out photosynthesis, which provides food for corals, while corals get oxygen and nutrients. (.....)
6. Lions compete for gazelles. (.....)

4 What happens when:

1. Food sources lack in a balanced ecosystem?
.....
.....
2. Food shortage occurs for a group of hyenas?
.....
.....
3. One of the living organisms present in a balanced ecosystem is absent?
.....
.....
4. The number of primary consumers increases?
.....
.....
5. The number of secondary consumers decreases?
.....
.....





5 Study the figures below, then answer the following questions:



a. Which of these creatures is a carnivore, omnivore, herbivore, or scavenger?

.....

.....

b. Compare between the lion and the horse in terms of:
Type of food – Shape of the teeth

P.O.C	Lion	Horse
a. Type of Food		
b. Shape of the Teeth		

6 The following figure shows a living organism. Answer the questions below:

a. What is the name of this organism?

.....

b. What organisms does it feed on?

.....

c. What is the benefit of this organism to the environment?

.....





7 Create food chains and a food web from the following organisms:

Carrot – Shrimp – Grass – Seal – Wheat – Deer – Mouse – Rabbit – Bacteria –
Fungi – Sparrow – Fox – Falcon – Snake – Fish – Bear – Algae – Lion

Food chains:

.....

.....

.....

Food web:

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

8 Create an energy pyramid from the following:

Carrot – Shrimp – Grass – Seal – Wheat – Deer – Mouse – Rabbit – Sparrow –
Fox – Falcon – Snake – Fish – Bear – Algae – Lion

.....

.....

.....

.....

.....

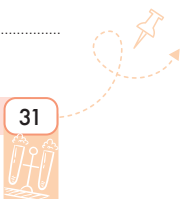
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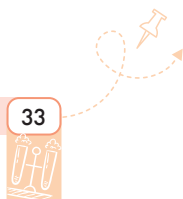
1 Put (✓) or (X):

1. Inherited traits are those passed from offspring to parents. ()
2. The brown eye color is an acquired trait. ()
3. The presence of a solid body structure covering the turtle is an inherited trait. ()
4. Instinctive behaviors are passed from parents to offspring without learning. ()
5. Acquired traits are not inherited and are acquired by humans from the environment. ()
6. Breastfeeding is an acquired trait. ()
7. The genetic material is found in the cytoplasm of the eukaryotes. ()
8. Chromosomes are thread-like bodies found inside the nucleus in the bean plant. ()
9. A chromosome consists of two strands, each of which is called a chromatid. ()
10. The number of chromosomes in humans is 46 chromosomes, and in corn is 32 chromosomes. ()
11. The chromosome is chemically composed of DNA and protein. ()
12. DNA is made up of small parts known as nucleotides. ()
13. Spontaneous mutation occurs without human intervention. ()
14. Production of featherless chickens is considered induced mutation. ()
15. Scoliosis (spinal deformity) is a lethal mutation. ()
16. Severe muscle atrophy and weakness is a lethal mutation. ()
17. The light skin color of people living in cold regions is a beneficial mutation. ()
18. Production of cube-shaped watermelons is an example of induced mutations. ()
19. People who suffer from lactose intolerance experience cramps and nausea when they eat meat. ()
20. Beneficial mutations cause the appearance of desirable traits. ()



2 Complete the following sentences:

1. The genetic material is found in the of prokaryotic organisms, and in the of eukaryotic organisms.
2. Examples of hereditary traits in humans are and
3. Examples of acquired traits in humans are and
4. A hen sitting on eggs is an example of a/an behavior, while a dolphin playing with a ball is a/an trait.
5. Chromosomes are found in a shape inside the nucleus.
6. Genetic traits are passed from parents to offspring through
7. A chromosome is made up of connected at the
8. The chromosome chemically consists of and a protein known as
9. DNA is made up of small units called
10. Each gene consists of smaller units called
11. Nucleotides exist in the form of twisted around each other, and the two strands are called
12. Each chromosome carries thousands or millions of, which vary in number from one chromosome to another in the cells of the same individual.
13. The mixture used in separating a strawberry chromosome consists of and with
14. is considered the founder of genetics, and he conducted his experiments on the plant.
15. The scientists and arrived at a working hypothesis for expressing genetic traits and it is known as
16. Genes produce, which are responsible for a chemical reaction that leads to the formation of, showing the genetic trait.
17. Spinal curvature is a result of mutations, while is a result of lethal mutations.





18. The production of seedless lemons is a result of mutations.

3 Give one example of each of the following:

1. A hereditary trait in humans. (.....)
2. An acquired trait in a horse. (.....)
3. An instinctive behavior in a chicken. (.....)
4. A spontaneous mutation in humans. (.....)
5. An induced mutation in chickens. (.....)
6. A beneficial mutation in humans. (.....)
7. A fatal (lethal) mutation in humans. (.....)
8. A harmful mutation in humans. (.....)
9. An alternative to butter for a person suffering from lactose intolerance. (.....)
10. An alternative to milk for a person suffering from lactose intolerance. (.....)
11. An alternative to chocolate milk for a person suffering from lactose intolerance. (.....)

4 Classify the following as hereditary traits, acquired traits, or instinctive behaviors:

1. Reading and writing (.....)
2. The length of a giraffe's neck (.....)
3. The squirrel breaking the shell of a nut (.....)
4. Learning to swim (.....)
5. The spider weaving its net (.....)
6. The short legs of the Arctic fox (.....)
7. Learning Hindi (.....)
8. Birds incubating eggs (.....)
9. Horses jumping hurdles (.....)
10. Facial freckles (.....)



11. Breastfeeding (.....)
12. Blood type (.....)
13. The dolphin playing with a ball (.....)
14. The bat sleeping upside down (.....)
15. Hair color (.....)

5 Compare between:

1. Hereditary traits and acquired traits, in terms of: Definition – Examples

P.O.C	Hereditary Traits	Acquired Traits
a. Definition		
b. Examples		

2. Acquired traits and instinctive behaviors, in terms of: Definition – Examples

P.O.C	Acquired Traits	Instinctive Behaviors
a. Definition		
b. Examples		

3. Spontaneous mutation and induced mutation in terms of: Definition - Examples

P.O.C	Spontaneous Mutation	Induced Mutation
a. Definition		
b. Examples		



4. Harmful mutation and lethal mutation in terms of examples

P.O.C	Harmful Mutation	Lethal Mutation
Examples		

6 What is meant by each of the following?

1. Genetics

2. Inherited traits

3. Instinctive behaviors

4. Acquired traits

5. Chromosomes

6. Centromere

7. Mutation

8. Spontaneous mutations

9. Induced mutations





7 Give reasons for:

1. The genes found on a single chromosome are different.
.....
.....
2. DNA is known as a double helix.
.....
.....
3. Smooth hair is considered a hereditary trait, while learning to swim is an acquired trait.
.....
.....
.....
4. A squirrel breaking a nut is considered an instinctive behavior.
.....
.....
5. Mendel is considered the founder of genetics.
.....
.....
6. Genes are considered responsible for the appearance of hereditary traits.
.....
.....
.....
7. A dark-skinned mother giving birth to an albino child is considered a spontaneous mutation.
.....
8. Light skin color in people living in cold regions is a beneficial spontaneous mutation.
.....
.....
9. Producing cube-shaped watermelons is considered an agricultural technique and not a mutation.
.....





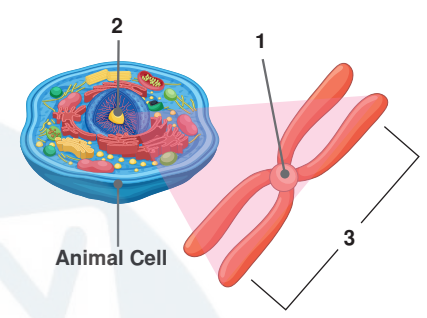
10. Lactose tolerance is considered a beneficial mutation.

.....

.....

8 Complete the data on the drawing:

- 1.
- 2.
- 3.



Determine the location of number (3) in bacteria and rabbits.

.....

.....

9 What are the consequences of:

1. A difference in the order of nucleotides in a single chromosome?

.....

.....

.....

2. The formation of genes for certain enzymes?

.....

.....

.....

.....

.....

3. Muscle atrophy and weakness in newborns?

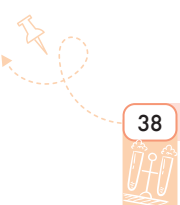
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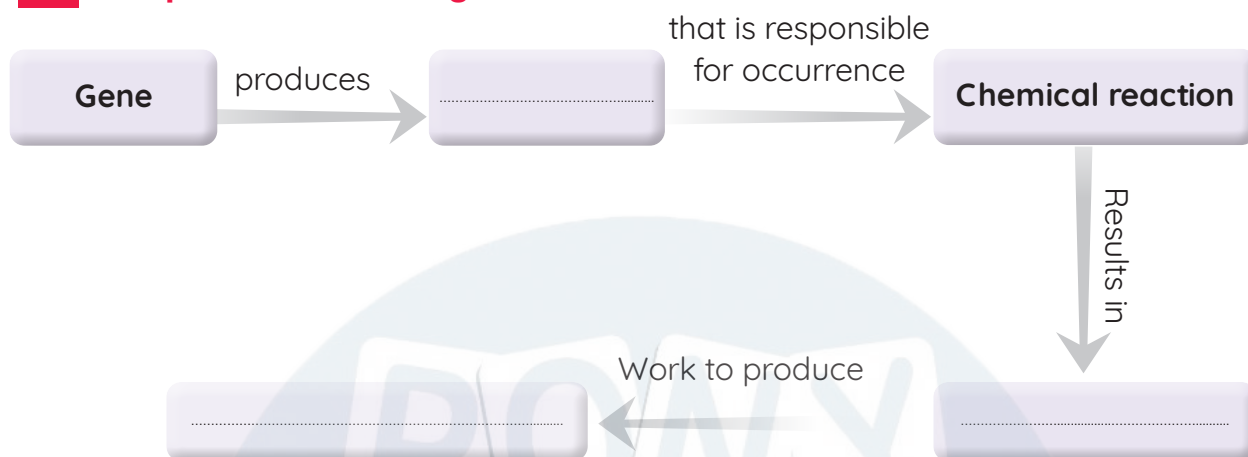
4. Placing watermelons in square-shaped metal molds when they grow?

.....

10 What is the benefit of genes?

.....



11 Complete the following chart:**12 From the opposite figure:**

1. What is this child known as?
.....
2. What is the reason for the child being born in this way?
.....



1 Put (✓) or (X):

1. The importance of the water cycle in nature is the renewal of water resources. ()
2. Water evaporates when it cools. ()
3. Water is used in many fields, including agriculture and industry. ()
4. The higher the temperature of water vapor, the faster the condensation. ()
5. There are many forms of precipitation, such as rain, snow, and hail. ()
6. Evaporation of water occurs when it comes into contact with a cold surface. ()
7. Winds move clouds containing heavier or smaller water droplets. ()

2 Complete the following sentences:

1. Water exists in three states, which are _____, solid, and _____.
2. Water changes from the liquid state to the _____ state when it gains _____.
3. Water changes from the gaseous state to the liquid state when it loses heat in a process known as _____.
4. Sources of water vapor in nature include _____, _____, and _____.
5. _____ is stored beneath the Earth's surface.
6. The basic stages of the water cycle are _____, condensation, _____, surface runoff, and _____.

3 Compare between:

1. Infiltration and surface runoff

Infiltration	Surface Runoff
.....	
.....	
.....	

2. Evaporation and transpiration

Evaporation	Transpiration
.....	
.....	
.....	

4 Choose from column (B) what suits it in column (A) :

Column (A)	Column (B)
1. The percentage of water in the human body.	a. 3%
2. The percentage of fresh water compared to the percentage of water on the Earth's surface.	b. 97%
3. The percentage of land in the Earth's composition.	c. 71%
4. The percentage of salt water compared to the percentage of water on the Earth's surface.	d. 29%
5. The percentage of water in the Earth's composition.	e. 70%
1. 2. 3. 4. 5.	

5 What is meant by each of the following:

1. Evaporation

.....

.....

2. Boiling

.....

.....

.....

3. Condensation

.....

.....

4. The water cycle

.....

.....



5. Transpiration process

.....

.....

6 State the importance of:

1. Water

.....

.....

2. The Sun in the water cycle in nature

.....

3. Gravity in the water cycle in nature

.....

4. Wind in the water cycle in nature

.....

5. The water cycle

.....

.....

7 Give reasons for the following:

1. Fresh water consumption must be rationalized.

.....

2. Water droplets form on the outer surface of a cup containing water and ice cubes.

.....

.....

3. The Sun and gravity maintain the continuity of the water cycle.

.....

.....

.....

4. Sea and ocean water are desalinated.

.....





8 What are the results of:

1. Placing a cup of water in a sunny place for several hours?

.....

.....

2. Placing pieces of ice in a cup of water?

.....

.....

3. The water cycle stopping suddenly?

.....

.....

4. The cloud temperature being below the freezing point?

.....

.....

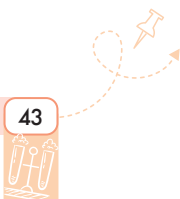
5. Small ice crystals gathering during thunderstorms?

.....

.....

الأستاذ

سلسلة كتب الأستاذ



1 Put (✓) or (X):

1. Rocks are solid bodies composed of only one mineral. ()
2. Rocks are classified into three types: sedimentary, igneous, and calcareous. ()
3. Only chemical changes lead to geological processes in rocks. ()
4. Weathering is the process of disintegrating and breaking down rocks. ()
5. Mechanical weathering is the process of disintegrating and breaking rocks without a change in their chemical composition. ()
6. Chemical weathering is the process of disintegrating and breaking rocks with a change in their properties. ()
7. Freezing of water in rock cracks causes the rocks to freeze. ()
8. Yellowstone National Park is a good example of chemical weathering. ()
9. Calcium carbonate powder is used to make casts for broken bones. ()

2 Complete the following sentences:

1. Rocks are classified into three types: _____, _____, and _____.
2. The freezing of water in cracks is one of the causes of _____.
3. The freezing of water in cracks, _____, and the thermal expansion and contraction of the minerals forming the rocks are among the causes of mechanical weathering.
4. Spherical weathering is a form of _____.
5. _____ and _____ are examples of sedimentary rocks.
6. Chemical substances, such as _____ and the mineral materials present in groundwater, cause chemical weathering.
7. _____ powder is used in making casts used for patients with bone fractures.

8. Sedimentary rocks are characterized by being and containing
9. When sedimentary rocks are exposed to and, they transform into metamorphic rocks.
10. When limestone rocks are exposed to heat and pressure, they transform into
11. When rocks are exposed to heat and pressure, they transform into quartzite rocks.
12. Igneous rocks are classified into two types: and
13. Examples of metamorphic rocks are and
14. Basalt rocks and are igneous rocks.
15. and are plutonic igneous rocks.
16. When sediments are exposed to compaction and lithification, they transform into
17. When igneous rocks are exposed to and, they transform into sediments.
18. Metamorphic rocks form when and rocks are exposed to heat and pressure.
19. Plants represent the organic source for the formation of , while represent the organic source for the formation of petroleum.
20. Natural gas is composed of, which makes up 90% of its components.

3 Which of the following rocks are sedimentary, igneous, or metamorphic rocks?

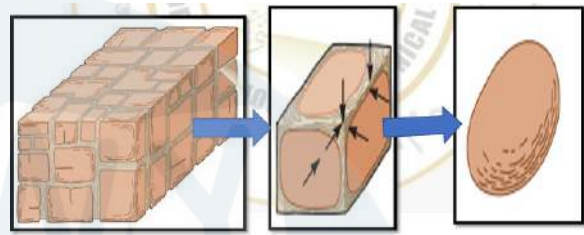
- | | |
|--------------|---------|
| 1. Granite | (.....) |
| 2. Marble | (.....) |
| 3. Limestone | (.....) |
| 4. Pumice | (.....) |
| 5. Basalt | (.....) |



- 6. Claystone (.....)
- 7. Gabbro (.....)
- 8. Quartzite (.....)
- 9. Sandstone (.....)

4 The following figure shows the formation of some rocks through chemical weathering, answer:

- 1. What is the name of weathering?
.....
- 2. Mention how it occurs.
.....
.....



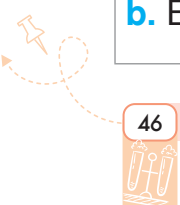
5 What are the rocks that can be transformed from one type to another?
.....
.....

6 What are the geological processes that occur to form rocks over the ages?
.....
.....

7 Compare between each the following:

- 1. Sedimentary, metamorphic, and igneous rocks, in terms of: Method of formation – Examples.

P.O.C	Sedimentary rocks	Metamorphic rocks	Metamorphic rocks
a. Method of formation			
			
			
			
			
			
b. Examples			
			



2. Plutonic and surface igneous rocks, in terms of: Method of formation – Crystal size – Examples.

P.O.C	Plutonic igneous rocks	Surface igneous rocks
a. Method of formation		
b. Crystal size		
c. Examples		

8 What is meant by each of the following:

1. Rocks

.....

2. Weathering

.....

3. Mechanical weathering

.....

4. Chemical weathering

.....

5. Erosion

.....

6. Lithification

.....



7. Sediments

.....

.....

8. Sedimentary rocks

.....

.....

9. Magma

.....

.....

10. Lava

.....

.....

11. Rock cycle

.....

.....

12. Fossil fuel

.....

.....

9 State the importance of:

1. Marble

.....

.....

2. Limestone rock powder

.....

.....

10 Give reasons for:

1. Yellowstone National Park is an example of chemical weathering.

.....

.....



2. The water coming from Ethiopia appears brown.

.....

.....

3. Erosion is both a beneficial and harmful process for the environment.

.....

.....

.....

4. Sedimentary rocks are characterized by being porous.

.....

.....

5. Sedimentary rocks are characterized by the presence of fossil.

.....

.....

6. The crystals of surface igneous rocks are small.

.....

.....

7. The crystals of plutonic igneous rocks are large.

.....

.....

11 What happens when:

1. A glass bottle of water is filled to its top and placed in the refrigerator for several hours?

.....

2. Water freezes in the cracks between the rocks?

.....

.....



3. Water flows between rocks?

.....

.....

4. The temperature of the minerals that make up the rock rises during the day?

.....

.....

5. The temperature of the minerals that make up the rock decreases at night?

.....

.....

6. Plant roots grow within the cracks between rocks?

.....

.....

7. We add drops of hydrochloric acid to a piece of limestone?

.....

.....

8. We bring a matchstick close to the gas produced by adding acid to the limestone?

.....

.....

9. Limestone rocks are exposed to heat and pressure?

.....

.....

10. Magma comes out to the Earth's surface?

.....

.....

11. Magma interferes between the cracks and layers of the Earth?

.....

.....



12 What is the name of each figure?



1



2

سلسلة كتب الاستاذ



3



4



5



6



7



8

Pony Revision on Unit 1 – Lesson 1

Metals and Nonmetals

First Week

1 Complete the following sentences:

1. The outermost energy level of metals contains less than four electrons, while that of nonmetals contains more than four electrons.
2. Element (A), with its outermost energy level (M) containing two electrons, is a metal, while element (B), with its outermost energy level (L) containing six electrons, is a nonmetal.
3. All metals are solids, except for mercury, which is a liquid.
4. All nonmetals are bad conductors of electricity, except for carbon (graphite), which is a good conductor of electricity.
5. Some nonmetals are solid materials, such as carbon; gaseous materials, such as nitrogen; and the only liquid is bromine.
6. The atoms of solid metals are arranged in a structure known as crystal lattice.
7. The metallic bond is formed due to the attraction between the positive ions of a metal and the cloud of valence negative electrons surrounding it.
8. The bronze alloy is composed of tin at 5% and copper at 95%.
9. The bronze alloy is used in manufacturing medals and jewelry.
10. The bronze alloy is characterized by being harder than copper and resistant to rust.

2 Cross out the odd word, and then write the relation between the remaining words:

1. Gold – Silver – Bromine – Mercury (Bromine)
(They are metallic elements.)
2. Phosphorus – Bromine – Mercury – Sulfur (Mercury)
(They are nonmetallic elements.)
3. Graphite – Bromine – Phosphorus – Sulfur (Graphite)
(They are bad electric conductors.)
4. Iodine – Sulfur – Carbon – Hydrogen (Hydrogen)
(They are solid nonmetallic elements.)
5. Bronze – Chlorine – Copper – Tin (Chlorine)
(They are metals or alloys containing metals)

3

1. Phosphorus and iron, in terms of:

- a.** Metallic luster
c. Conductivity of heat and electricity
b. Malleable and ductile
d. Melting point

P.O.C	Phosphorus	Iron
a. Metallic luster	It has no metallic luster.	It has a metallic luster.
b. Malleable and ductile	It is not malleable or ductile.	It is malleable and ductile.
c. Conductivity of heat and electricity	It is a bad conductor of heat and electricity.	It is a good conductor of heat and electricity.
d. Melting point	It has a low melting point.	It has a high melting point.

2. Sodium and graphite, in terms of:

- a.** Metallic luster

P.O.C	Sodium	Graphite
a. Metallic luster	It has a metallic luster.	It has no metallic luster.
b. Which one is opaque?	Shiny	Opaque

3. Sulfur and copper, in terms of:

- a.** Malleable and ductile **b.** Which one is more brittle?

P.O.C	Sulfur	Copper
a. Malleable and ductile	It is not malleable or ductile.	It is malleable and ductile.
b. Which one is more brittle?	Brittle	Hard

4. Silver and phosphorus, in terms of:

Conductivity of electric current

P.O.C	Silver	Phosphorus
Conductivity of electric current	It is a good conductor of electricity.	It is a bad conductor of electricity.



4 What is meant by each one of the following:

1. Metallic bond

It is the attraction force between the positive metal ions and the cloud of negative valence electrons surrounding them.

2. Alloy

It is a mixture that is composed of two or more molten metals.

3. Recycling

It is the process of conversion of the wastes into new usable substances.

5 What is the benefit of recycling metal wastes?

Recycling metals is much cheaper and easier than extracting them from their ores.

6 If elements (A & B) have melting points of (1538 & 115.21) respectively, answer the following questions:

1. What is the type of each one of them? And why?

- Element (A) is a metal because it has a high melting point.**
- Element (B) is a nonmetal because it has a low melting point.**

2. Which one of them is malleable and ductile?

- Element (A) is malleable and ductile because it is a metal.**

7 What happens if

1. We knock on a piece of graphite?

- The piece of graphite breaks off easily because graphite is a brittle nonmetal.**

2. We increase the number of valence electrons in the metal atoms according to the metallic bond?

- The strength of the metallic bond increases.**

3. We mix molten gold with molten copper?

- An alloy, which has different properties than gold and copper, is formed.**





8 Give reasons for the following:

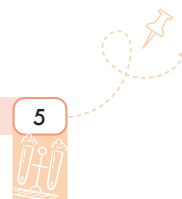
- Calcium ($_{20}\text{Ca}$) is a metal, while Chlorine ($_{17}\text{Cl}$) is a nonmetal.
 - Calcium ($_{20}\text{Ca}$) is a metal because it has 2 electrons in its last energy level.
 - Chlorine ($_{17}\text{Cl}$) is a nonmetal because it has 7 electrons in its last energy level.
- Carbon is used in the manufacture of dry cells although it is a nonmetal.
 - Because carbon is a good conductor of electricity.
- Calcium ($_{20}\text{Ca}$) is harder than sodium ($_{11}\text{Na}$).
 - Because the metallic bond in calcium is stronger than that in sodium, as calcium has two valence electrons, while sodium has one valence electron only.
- A bronze alloy is used in the manufacture of medals instead of copper.
 - Because a bronze alloy is harder than copper and it doesn't rust.

9 Complete the following table that shows some materials & their properties.

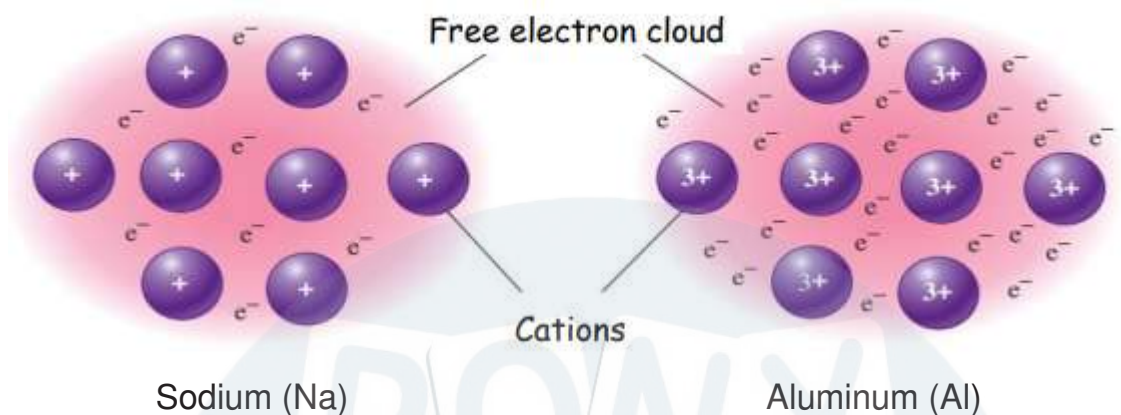
You can choose the color from the following words bank:

(Black - Colorless - Yellow - Waxy white - Silver - Red)

Element	Type	Physical State	Electric Conductivity	Color
1- Oxygen	Nonmetal	Gas	Bad conductor	Colorless
2- Gold	Metal	Solid	Good conductor	Yellow
3- Carbon	Nonmetal	Solid	Good conductor	Black
4- Bromine	Nonmetal	Liquid	Bad conductor	Red
5- Nitrogen	Nonmetal	Gas	Bad conductor	Colorless
6- Mercury	Metal	Liquid	Good conductor	Silver
7- Phosphorus	Nonmetal	Solid	Bad conductor	Waxy White



10 The following figure shows a bond between two different elements:



1. What are the types of the two elements in the figure? And why?
 - **The two elements are metals.**
 - **Because they have less than four electrons in their last energy levels.**
2. What is the valency of each?
 - **Sodium (Na) is monovalent +1**
 - **Aluminum (Al) is trivalent +3**
3. What is the type of bond in both of them?
 - **Metallic bond**
4. Which is stronger in terms of the bond? And why?
 - **The metallic bond in aluminum is stronger than that in sodium.**
(Aluminum has three valence electrons, while sodium has only one valence electron, so aluminum's metallic bond is stronger than sodium's metallic bond.)

Pony Revision on Unit 1 – Lesson 2

Acids and Alkalis

Second and
Third Weeks

1 Complete the following sentences:

1. The scientist Arrhenius clarified that acids are substances that dissolve in water and produce positive hydrogen ions, while bases, when dissolved in water, produce negative hydroxide ions.
2. The molecular formula of the carbonate group is CO_3^{-2} , while the molecular formula of the sulphate group is SO_4^{-2} .
3. Oxygenated acids are those that contain oxygen element, such as sulphuric acid and nitric acid.
4. Non-oxygenated acids don't contain oxygen element, such as hydrochloric acid and hydrobromic acid.
5. The number of hydrogen atoms in an acid molecule is equal to the charge of the anion that forms it.
6. The number of hydroxide groups in a base molecule equals the charge of the cation that forms it.
7. Lactic acid provides the muscles with energy during a lack of oxygen, and its accumulation in the muscles causes muscle cramps.
8. The molecular formula of acids starts with a positive hydrogen cation, and their names are associated with the anion in their composition.
9. The molecular formula of alkalis (bases) ends with a hydroxide group, and their names are associated with the cation in their composition.
10. The molecular formula of alkalis (bases) that contain a cation Ca^{+2} is Ca(OH)_2 .
11. The total charge of molecules of any compound equals zero.
12. The stomach secretes hydrochloric acid, which helps in food digestion.
13. Lemon and ketchup are considered acidic substances, while toothpaste and baking soda are considered alkaline substances.
14. When hydrochloric acid dissolves in water, it produces a positive Hydrogen (H^+) ion and a negative chloride (Cl^-) ion.

15. When magnesium hydroxide dissolves in water, it forms a **positive magnesium** ion and a **negative hydroxide** ion.
16. Acids react with alkalis to form **salt** and **water**.
17. Nitric acid is considered from **strong** acids, while nitrous acid and sulfurous acid are considered from **weak** acids.
18. Metals burn in the presence of oxygen gas, forming **metal oxides**, and most of them are known as **basic** oxides.
19. Nonmetals burn in the presence of oxygen gas, forming **nonmetal oxides**, and most of them are known as **acidic** oxides.
20. The dissolution of sulphur trioxide (SO_3) in water forms **sulphuric acid** H_2SO_4 .
21. Dissolving **magnesium oxide (MgO)** in water forms magnesium hydroxide.
22. The combustion of fossil fuels produces oxides of **SO_2** and **NO_2** .

2 How to differentiate between:

1. The bicarbonate group and the sulphate group, in terms of the number of charges they carry - the molecular formula.

P.O.C	Bicarbonate group	Sulphate group
a. The number of charges they carry	One negative charge	Two negative charges
b. The molecular formula	HCO_3^-	SO_4^{2-}

2. Sulphuric acid and calcium hydroxide, in terms of the molecular formula.

P.O.C	Sulphuric acid	Calcium hydroxide
The molecular formula	H_2SO_4	Ca(OH)_2

3. Sulphurous acid and sulphuric acid, in terms of the molecular formula.

P.O.C	Sulphurous acid	Sulphuric acid
The molecular formula	H_2SO_3	H_2SO_4

4. Acidic oxides and basic oxides,
according to the definition - the result of their dissolution in water.

P.O.C	Acidic oxides	Basic oxides
a. Definition	They are nonmetal oxides that dissolve in water, forming acids.	They are metal oxides that dissolve in water, forming alkalis.
b. The result of their dissolution in water	Acids	Alkalis

5. Sulphurous acid and sulphuric acid,
according to the molecular formula - strength and weakness.

P.O.C	Sulphurous acid	Sulphuric acid
a. The molecular formula	H₂SO₃	H₂SO₄
b. Strength and weakness	Weak acid	Strong acid

3 Give one example of each of the following:

- A positive atomic group.
Ammonium atomic group (NH₄⁺)
- A non-oxygenated acid that forms an anion in a liquid state.
Hydrochloric acid (HCl)
- An acid secreted by the stomach.
Hydrochloric acid (HCl)
- An oxygenated acid that carries three negative charges.
Phosphoric acid (H₃PO₄)
- An acid secreted by the muscles.
Lactic acid
- A weak acid.
Nitrous acid (HNO₂)
- A strong acid.
Hydrochloric acid (HCl)

8. A strong alkali.

Sodium hydroxide (NaOH)

9. A weak alkali.

Ammonium hydroxide (NH₄OH)

10. A metallic oxide.

Magnesium oxide (MgO)

11. A non-metallic oxide.

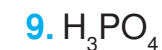
Sulphur trioxide (SO₃)

4 Write the chemical formula for the following compounds:

1. Hydrosulphuric acid (**H₂S**)
2. Hydrobromic acid (**HBr**)
3. Sulphurous acid (**H₂SO₃**)
4. Phosphoric acid (**H₃PO₄**)
5. Ammonium hydroxide (**NH₄OH**)
6. Hydrochloric acid (**HCl**)
7. Sulphuric acid (**H₂SO₄**)
8. Nitric acid (**HNO₃**)
9. Potassium hydroxide (**KOH**)
10. An atomic group consisting of three elements (**HCO₃**)
11. Nitrous acid (**HNO₂**)

5 Write the names of the following chemical compounds and state their type:

1. H₂SO₄ (**Sulphuric acid**) (**Oxyacid**)
2. H₂CO₃ (**Carbonic acid**) (**Oxyacid**)
3. HCl (**Hydrochloric acid**) (**Acid that doesn't contain oxygen**)
4. HNO₂ (**Nitrous acid**) (**Oxyacid**)
5. MgO (**Magnesium oxide**) (**Basic oxide**)
6. SO₃ (**Sulphur trioxide**) (**Acidic oxide**)
7. Mg(OH)₂ (**Magnesium hydroxide**) (**Alkali**)
8. H₂S (**Hydrosulphuric acid**) (**Acid that doesn't contain oxygen**)



(Phosphoric acid) (Oxyacid)



(Sodium chloride) (Salt)

6 What is meant by each of the following:**1. Atomic group**

It is an ion composed of more than one atom of more than one element.

2. Acids

They are substances that dissolve in water and give positive hydrogen ions H^+ .

3. Alkalis

They are substances that dissolve in water and give negative hydroxide ions OH^- .

4. Acidic oxides

They are nonmetal oxides that dissolve in water, forming acids.

5. Basic oxides

They are metals oxides that dissolve in water, forming alkalis.

6. Acid rains

They are rains resulting from the dissolution of acidic oxides in the water vapor of the atmosphere.

7 What is the benefit of each of the following:**1. Stomach acid**

It participates in the food digestion.

2. Lactic acid

It provides the muscle with oxygen when oxygen is lacking.

3. Milk of magnesia

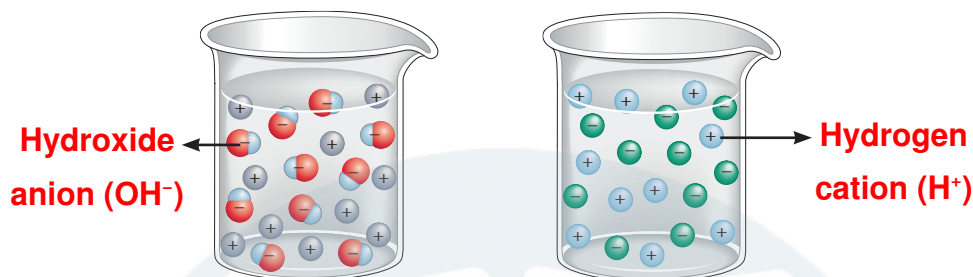
To neutralize gastric acidity as it contains magnesium hydroxide.

4. Litmus paper

To differentiate between acids and alkali, as acids turn the litmus strip into red, while alkalis turn the litmus strip into blue.

8 Study the following figures, and then answer the questions below:

The two figures show two compounds, one alkaline and the other acidic.



1. Which is acidic and which is alkaline?

Compound (1) is acidic, while compound (2) is alkaline.

2. Which of them results from the dissolution of a nonmetal and which results from the dissolution of a metal?

1. An acidic compound results from the dissolution of a nonmetal.

2. An alkaline compound results from the dissolution of a metal.

3. What is the result of adding the first tube to the second tube?

Salt and water are formed

4. How do you differentiate between them with a litmus strip?

Compound (1) turns the blue litmus strip into red.

Compound (2) turns the red litmus strip into blue.

9 Study the following figures, and then answer the questions below:

The two opposite figures show two alkali compounds, which are sodium hydroxide and ammonium hydroxide.

1. Write the chemical formula for each of them.

Sodium hydroxide $\rightarrow \text{NaOH}$

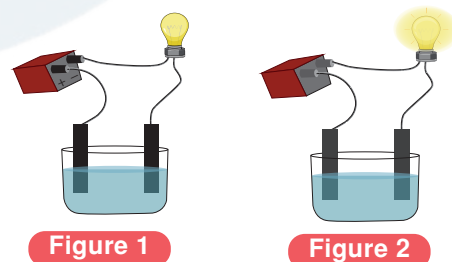
Ammonium hydroxide $\rightarrow \text{NH}_4\text{OH}$

2. Which one of them is weakly alkaline? And why?

Figure 1 (ammonium hydroxide) because a weak alkali doesn't conduct electricity well.

3. Which one of the two figures represents (NaOH)?

Figure (2)



10 Study the following figures, and then answer the questions below:

The two figures show the combustion of two elements:



**Combustion of a
magnesium ribbon**



**Combustion of sulphur
crystals**

1. Which is a metal and which is a nonmetal?

Magnesium is a metal, while sulphur is a nonmetal

2. What is the result of combustion of each of them?

- **The combustion of magnesium produces magnesium oxide (MgO).**
- **The combustion of sulphur produces sulphur trioxide (SO₃).**

3. How do we differentiate between them through practical experience?

- **When magnesium oxide dissolves in water, it forms an alkali, which turns the red litmus strip into blue.**
- **When sulphur trioxide dissolves in water, it forms an acid, which turns the blue litmus strip into red.**

11 Give reasons for the following:

1. Acids turn the blue litmus paper into red.

- **Because acids dissolve in water, giving a hydrogen cation H⁺.**

2. Alkalis turn the red litmus paper into blue.

- **Because alkalis dissolve in water, giving a hydroxide anion OH⁻.**

3. Milk of magnesia is used to treat stomach acidity.

- **To neutralize the gastric acidity, as it contains Mg(OH)₂.**

12 What happens when:

1. An electric current passes through sulphuric acid and acetic acid, according to the lighting of the lamp?

Sulphuric acid is a strong acid, so the light of the lamp will be strong, while acetic acid is a weak acid, so the light of the lamp will be weak.

2. Acids are mixed with alkalis?

Salt and water are formed.

3. You heat a piece of magnesium, and then add water to the product?

Magnesium oxide (MgO) is formed, which dissolves in water giving magnesium hydroxide $\text{Mg}(\text{OH})_2$.

4. You heat a piece of sulphur? سلسلة كتب الأستاذ

Sulphur trioxide (SO_3) is formed.

5. You add water to the previous product?

Sulphuric acid (H_2SO_4) is formed.

6. You put a blue litmus paper in the previous solution?

The litmus paper will turn into red.

7. Sulphur oxide is dissolved in rain water? سلسلة كتب الأستاذ

Acid rain is formed.

13 Mention the damages caused by acid rains.

- 1. Destruction of forests.**
- 2. Harming aquatic organisms.**
- 3. Harming the respiratory system.**
- 4. Corrosion of buildings.**

Pony Revision on Unit 1 – Lesson 3

Chemical Indicators and Salts

Fourth Week

1 Complete the following sentences:

1. **Chemical indicators** are chemical substances that change their color in an acidic medium compared to a basic medium, such as **litmus indicator**.
2. Distilled water has a neutral effect and does not change the color of the litmus strip due to the equal number of H^+ ions with OH^- ions.
3. There are many indicators, such as litmus strip and **universal indicator**.
4. We reduce soil acidity by adding **basic** materials, such as **calcium hydroxide $Ca(OH)_2$** .
5. The pH value of acids is **less** than 7, while the pH value of **bases** is greater than 7.
6. The pH value of a table salt solution (sodium chloride) is **seven**.
7. The pH value is accurately measured by using a device called **pH meter**.
8. Acidic gases include **carbon dioxide (CO_2)** and **nitrogen dioxide (NO_2)**.
9. Basic gases include **ammonia gas (NH_3)**.
10. Neutral gases, which do not affect a litmus strip, include **hydrogen gas (H_2)** and **oxygen gas (O_2)**.

2 Cross out the odd word, and then write the relation between the remaining words:

1. Universal indicator strips – Litmus paper – Voltmeter – pH meter
(**Voltmeter**)
(The others are chemical indicators.)
2. N_2 – H_2O – H_2 – HCl (HCl)
(The others have neutral effect on the litmus strip.)
3. SO_2 – Cl_2 – CO_2 – NH_3 (NH_3)
(The others are acidic gases.)
4. HNO_3 – H_2SO_4 – H_2O – HCl (HCl)
(The others are acids.)

3 How do you differentiate between each of the following:

1. Distilled water and hydrochloric acid in two ways

P.O.C	Distilled water	Hydrochloric acid
a. By litmus indicator	It doesn't change the color of the litmus strip.	It turns the color of the blue litmus strip into red.
b. By pH meter	The pH value equals seven.	The pH value is less than seven.

2. CO₂ and O₂ gases

P.O.C	CO ₂	O ₂
a. By a wet litmus strip	It turns the color of the blue litmus strip into red.	It doesn't change the color of the litmus strip.

3. Ammonia gas and nitrogen dioxide gas

P.O.C	Ammonia gas	Nitrogen dioxide
a. By a wet litmus strip	It turns the color of the red litmus strip into blue.	It turns the color of the blue litmus strip into red.

4 Give one example of each of the following:

- | | |
|--|---------------------------|
| 1. A gas that turns the blue litmus strip into red. | Carbon dioxide gas |
| 2. A gas that turns the red litmus strip into blue. | Ammonia gas |
| 3. A gas that has a neutral effect on the litmus paper. | Hydrogen gas |
| 4. A chemical indicator that measures the pH accurately. | pH meter |

5 What is meant by each one of the following:

1. Indicators

They are chemical substances whose color differ in the acidic medium from the alkaline medium.

2. Universal indicator

It is a chemical indicator that can be used to distinguish between acids and alkalis, acids and each other, or alkalis and each other according to their strength.

3. pH value

It is a scale ranging from 0 to 14 that indicates the acidity or the basicity of a solution.

6 Answer the following questions:

1. If you have nitric acid and nitrous acid:

- 1 Write their molecular formula.

Nitric acid $\rightarrow \text{HNO}_3$

Nitrous acid $\rightarrow \text{HNO}_2$

- 2 Which one is strong and which one is weak?

Nitric acid is a strong acid, while nitrous acid is a weak acid.

- 3 How do you differentiate between them?

By measuring the pH value of them using a pH meter device, the pH value of nitrous acid is more than that of nitric acid.

2. If you have two compounds (A) & (B) and their pH values are (8.5 and 3) respectively:

- 1 Determine the type of each one.

Compound (A), with pH value 8.5, is a base (alkali), while compound (B), with pH value 3, is an acid.

- 2 What happens when you mix them together?

They will produce salt and water.

7 Give reasons for the following:

1. Litmus paper is not suitable for distinguishing between strong and weak acids.

Because the litmus strip gives the same color with both of them.

2. Litmus paper doesn't affect distilled water.

Because distilled water is a neutral solution, as the number of cations of H^+ equals the number of anions of OH^- .



3. Nitric acid turns the blue litmus paper into red.

Due to the presence of hydrogen cations (H^+).

4. Calcium hydroxide turns the red litmus paper into blue.

Due to the presence of hydroxide anions (OH^-).

8 What happens in each one of the following:

1. You put a piece of sugar in a test tube containing sulphuric acid?

The sugar becomes black (charred).

2. You place two red and blue litmus strips in a tube of hydrogen gas?

The colors of the two wet litmus strips don't change.

3. You place two red and blue litmus strips in a tube containing chlorine gas?

The color of the two wet litmus strips is removed.

4. You place two red and blue litmus strips in a tube containing carbon dioxide gas?

- The color of the blue wet litmus changes into red.

- The color of the red wet litmus does not change.

5. You place two red and blue litmus strips in a tube containing ammonia gas?

- The color of the blue wet litmus does not change.

- The color of the red wet litmus changes into blue.

6. You add calcium hydroxide to acidic soil?

Calcium hydroxide is an alkaline substance, so it will treat and reduce the soil acidity.



Pony Revision on Unit 2

Energy and Its Applications

Sixth and
Seventh Weeks

1 Complete the following sentences:

Lesson 1: Potential Energy

- Meter and kilometer are the measuring units of distance and displacement.
- km/h and m/s are the measuring units of speed.
- Speed = $\frac{\text{Distance}}{\text{Time}}$
- Joule is the measuring unit of work, while newton is the measuring unit of force.
- Work = Force $\times$ Displacement
- The factors affecting potential energy are weight and height.
- Newton is the measuring unit of weight.
- Five kilometers = 5000 meters, while three kilojoules = 3000 joules.

Lesson 2: Kinetic Energy

- The factors affecting the kinetic energy of an object are mass and speed.
- The measuring unit of kinetic energy is joule and is equal to kg x (m/s)².
- The kinetic energy of an object = $\frac{1}{2} m \times v^2$.
- Kinetic energy is directly proportional to mass and square of speed.
- The more the mass of the object, the slower the speed when the kinetic energy is constant.
- If the speed of the body increases into three times, its kinetic energy increases into 9 times of its value.

2 Choose from columns (B) and (C) what suits column (A):

Lesson 1: Potential Energy

Column (A)	Column (B)	Column (C)
1. Work	1. m/s	1. w x h
2. Potential energy	2. N	2. F x s
3. Weight	3. J	3. m x g
4. Speed	4. N.m	4. d $\div$ t
1. 3, 2 2. 4, 1	3. 2, 3 4. 1, 4	

3 Complete the following table:**Lesson 2: Kinetic Energy**

Number	Kinetic Energy (KE) (Joules)	Speed (v) (m/s)	Mass (m) (kg)
(1)	64	8	2
(2)	48	4	6
(3)	96	5.6	6

4 Compare between:**Lesson 2: Kinetic Energy**

Kinetic energy and potential energy in terms of:

Definition – mathematical relationship – affecting factors

Device	Kinetic Energy	Potential Energy
a. Definition	It is the gained energy by an object as a result of its motion.	It is the stored energy in the object as a result of the work done on it.
b. Mathematical Relationship	$KE = \frac{1}{2}mv^2$	$PE = mgh$
c. Affecting Factors	1- Object's mass 2- Object's speed	1- Object's weight 2- Object's height

5 What is meant by each of the following?**Lesson 1: Potential Energy****1. Movement path.**

It is a set of points that an object passes through during its movement.

2. Distance.

It is the total length of any path taken by the object during its motion from the starting point to the end point.

3. Displacement.

It is the shortest straight path connecting the starting point and the end point in a constant direction.



4. Speed.

It is the distance covered by a moving object per a unit of time.

5. Work.

It is the amount of energy required to move an object through a certain displacement in the same direction of the force that acts on it.

6. Energy.

It is the ability to do work.

7. Potential energy.

It is the stored energy in an object as a result of the work done on it.

8. The independent variable.

It is the variable that is changed during the experiment.

9. The dependent variable. سلسلة كتب الأستاذ

It is the variable to be tested, which changes in response to changing the independent variable.

10. Controlled variables.

They are the variables controlled to remain constant throughout the experiment.

Lesson 2: Kinetic Energy

11. Kinetic energy. سلسلة كتب الأستاذ

It is the gained energy by an object as a result of its motion.

Or

It is the work done during the motion of an object.

6 What is meant by:

Lesson 1: Potential Energy

1. The distance traveled by an object is 50 meters.

This means that the total length of the path taken by the object during its motion from the starting point to the end point equals 50 meters.

2. The displacement of a body is 30 meters.

This means that the length of the shortest straight path connecting between the starting and the end point in a constant direction equals 30 meters.





3. A body's speed is 120 km/h.

This means that this body covers a distance of 120 km in one hour.

4. A moving car travels 720 meters in two minutes.

This means that the speed of this car equals 6 m/s.

$$V = \frac{d}{t} = \frac{720}{2 \times 60} = 6 \text{ m/sec}$$

5. The potential energy of a body is 60 joules.

This means that the energy stored in the body as a result of the work done equals 60 joules.

6. The energy stored in a body as a result of the work done is 0.5 kilojoules.

This means that the potential energy equals 500 Joules.

Lesson 2: Kinetic Energy

7. The kinetic energy of an object is 250 joules.

This means that the gained energy by the object as a result of its motion equals 250 joules.

7 What happens when:

Lesson 2: Kinetic Energy

1. The speed of a moving object increases into the double with a constant mass, according to its kinetic energy?

The kinetic energy will increase 4 times of its value.

2. The mass is doubled and the speed is decreased to half, according to the kinetic energy?

The kinetic energy will decrease to half of its value.

3. Two cars, (1) and (2), move at different speeds and have the same mass, according to the kinetic energy?

The two cars (1) and (2) will move with different kinetic energies.

8 When will the following happen?

Lesson 1: Potential Energy

1. The speed is equal to zero.

When the object is static (There is no distance covered by the object).



2. The work is equal to zero.

1) If the object doesn't move. (The displacement = zero).

2) If the direction of the acting force is opposite to the direction of the object's motion.

3. The potential energy equals zero.

When the object reaches the ground, as the height of the object equals zero.

4. The distance equals the displacement.

When the object moves in a straight line in one direction.

5. The speed equals the distance.

When the object covers this distance in a unit time (1 sec or 1 h).

Lesson 2: Kinetic Energy

6. The kinetic energy = zero.

When the object is static and its speed is zero.

7. The kinetic energy is numerically equal twice the mass of the body.

When the speed of the body is 2 m/s.

9 Give reasons for:

Lesson 1: Potential Energy

1. The work done by a car is less than the work done by a truck, even though their speeds are equal.

Because the mass of the truck is greater than the mass of the car.

2. The work required to stop a moving car at a high speed increases.

Because the car that moves at a high speed has a high kinetic energy.

Lesson 2: Kinetic Energy

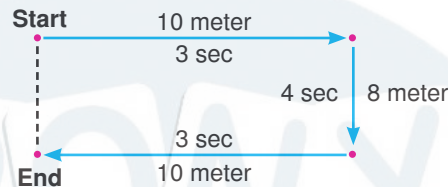
3. The kinetic energy of the car decreases when the driver presses the car's brakes.

Because when the driver presses the car's brakes, the speed of the car decreases.

10 Problems:

Lesson 1: Potential Energy

1. A body moves 10 meters east in 3 seconds, then moves 8 meters south in 4 seconds, then moves 10 meters west in 3 seconds. Calculate:
- a. Total distance b. Displacement c. Body speed

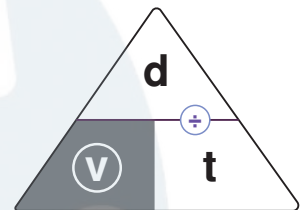


a. Total distance (d) = $10 + 8 + 10 = 28 \text{ m}$

b. Displacement (s) = 8 m

c. Time = $3 + 4 + 3 = 10 \text{ sec}$

$$v = \frac{d}{t} = \frac{28}{10} = 2.8 \text{ m/sec}$$



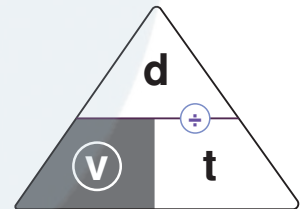
2. Calculate the speed of a body that covered a distance of 50 km in two hours.

$d = 50 \text{ km}$

$t = 2 \text{ h}$

$v = ?$

$$v = \frac{d}{t} = \frac{50}{2} = 25 \text{ km/h}$$



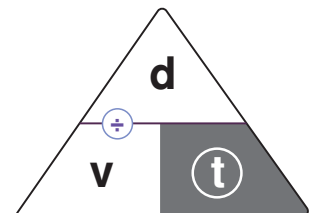
3. Calculate the time required to cover a distance of 300 meters if the body is moving at a speed of 20 m/s.

$d = 300 \text{ m}$

$v = 20 \text{ m/s}$

$t = ?$

$$t = \frac{d}{v} = \frac{300}{20} = 15 \text{ sec}$$



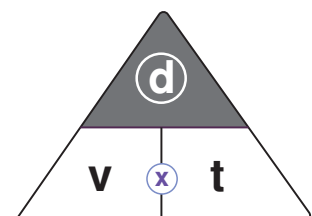
4. If a body moves at a speed of 20 km/h, calculate the distance traveled after three hours.

$v = 20 \text{ km/h}$

$t = 3 \text{ hours}$

$d = ?$

$$d = v \times t = 20 \times 3 = 60 \text{ km}$$



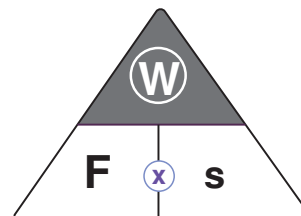
5. A person pushed an object with a force of 40 Newtons and it moved in a straight line a distance of 10 meters. Calculate the amount of work done.

$$F = 40 \text{ N}$$

$$S = 10 \text{ m}$$

$$W = ?$$

$$W = F \times S = 40 \times 10 = 400 \text{ J}$$



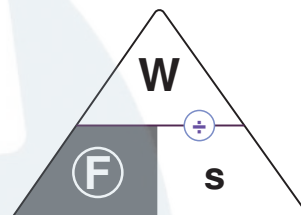
6. A body does work of 50 joules to move a bicycle a distance of 10 meters. Calculate the amount of force required to do the work.

$$W = 50 \text{ J}$$

$$s = 10 \text{ m}$$

$$F = ?$$

$$F = \frac{W}{s} = \frac{50}{10} = 5 \text{ N}$$



7. Calculate the potential energy of a body with a mass of 15 kg at a height of 150 cm, knowing that the acceleration due to gravity is 10 Newton/kg.

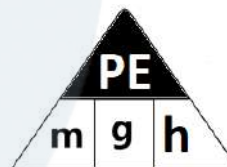
$$PE = ?$$

$$m = 15 \text{ kg}$$

$$g = 10 \text{ N/kg}$$

$$h = 1.5 \text{ m}$$

$$PE = m \times g \times h = 15 \times 10 \times 1.5 = 225 \text{ J}$$



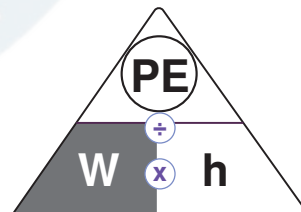
8. If a body has a potential energy of 240 joules at a height of 12 meters, calculate the weight of the body.

$$PE = 240 \text{ J}$$

$$h = 12 \text{ m}$$

$$W = ?$$

$$W = \frac{PE}{h} = \frac{240}{12} = 20 \text{ N}$$



Lesson 2: Kinetic Energy

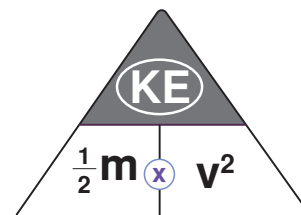
9. Calculate the kinetic energy of a ball with a mass of 20 kg moving at a speed of 4 m/s.

$$KE = ??$$

$$m = 20 \text{ kg}$$

$$v = 4 \text{ m/s}$$

$$KE = \frac{1}{2} m \times v^2 = \frac{1}{2} \times 20 \times 4^2 = 160 \text{ J}$$



10. Calculate the kinetic energy of a body weighing 20 Newtons moving at a speed of 6 m/s.

$$w = 20 \text{ N}$$

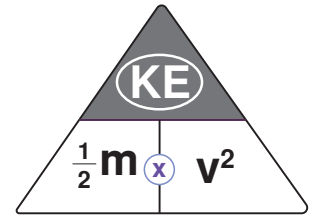
$$v = 6 \text{ m/s}$$

$$g = 10$$

$$w = m \times g$$

$$m = \frac{w}{g} = \frac{20}{10} = 2 \text{ kg}$$

$$KE = \frac{1}{2} m \times v^2 = \frac{1}{2} \times 2 \times 36 = 36 \text{ J}$$



11. Calculate the kinetic energy of a body with a mass of 500 g that travels 20 meters in 4 seconds.

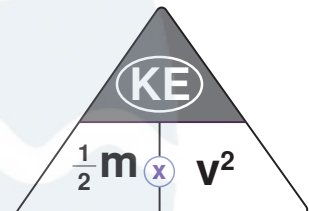
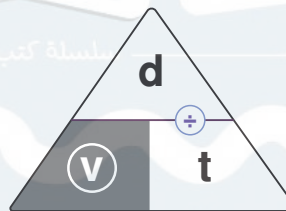
$$m = 500 \text{ g} = \frac{500}{1000} = 0.5 \text{ kg}$$

$$d = 20 \text{ m}$$

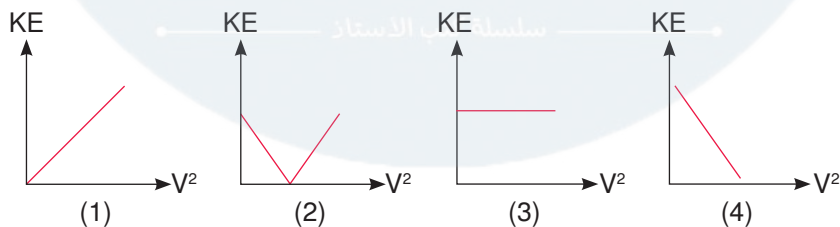
$$t = 4 \text{ s}$$

$$v = \frac{d}{t} = \frac{20}{4} = 5 \text{ m/s}$$

$$KE = \frac{1}{2} m \times v^2 = \frac{1}{2} \times 0.5 \times 5 \times 25 = 6.25 \text{ J}$$



12. The following figures show the relationship between kinetic energy and velocity when the mass is constant. Determine which of them represents:



1. Its kinetic energy increases. (1)
2. Its kinetic energy decreases. (4)
3. Its kinetic energy remains constant. (3)

Pony Revision on Unit 3 – Lesson 1

Nutritional Relationship in Biological Communities

Eighth and
Ninth Weeks

1 Complete the following sentences:

1. The ecosystem consists of living organisms and non-living things.
2. There are non-living components in the ecosystem, such as air and water.
3. The ecosystem consists of several levels: the individual, biotic population, and biological community.
4. Species is considered the basic unit in the classification of living organisms.
5. A commensal is the individual that benefits from commensalism.
6. A host is the one that is neither benefited nor harmed in commensalism.
7. Each stage in which energy is transferred in the food chain is called trophic level.
8. The rabbit and the horse are considered herbivores because they have incisors for cutting plants.
9. Carnivorous animals, such as lions and snakes, are characterized by having sharp canines to tear their prey.
10. Omnivorous animals, such as bears and mice, feed on both meat and plants.
11. Hyenas and vultures are considered scavengers as they feed on the remains of dead organisms.

2 What is meant by each of the following?

1. Ecosystem

It is an area that consists of living organisms and non-living components.

2. Biocommunity

It includes the various populations of different species that inhabit the same environment.

3. The individual

It is a single living organism that belongs to a specific species.



4. Predation

It is a nutritional relationship between two living organisms, one benefits (predator) and the other is harmed (prey).

5. Competition

It is a nutritional relationship between two individuals of the same species for a food source that is found in limited quantities, which negatively impacts their growth or survival.

6. Mutualism

It is a nutritional relationship between two individuals, both of them benefits from each other without causing harm to either of them.

7. Commensalism

It is a nutritional relationship between two individuals that benefits one organism, known as the commensal, while the other organism, known as the host, neither benefits nor is harmed.

8. Decomposers

They are living organisms that obtain their food from the dead bodies.

9. Food chain

It is the path of energy transfer in the form of food as it moves from one living organism to another within the ecosystem.

10. Food web

It is the interconnection and overlapping of multiple food chains.

11. Energy pyramid

It is a pyramid that represents the flow of energy and the amount of energy at each trophic level in a food chain.

12. Biological control

It is a food system that uses (utilizes) living organisms to eliminate agricultural pests instead of using pesticides

3 Mention the type of food relationship in each of the following:

1. The remora fish that sticks to the shark's body and gets its food remains without affecting the shark. **(Commensalism)**



2. Falcons hunt mice. (Predation)
3. The trees in the forest are densely packed together, blocking light from the short trees. (Competition)
4. Spiders hunt insects. (Predation)
5. Algae live inside the coral tissues and carry out photosynthesis, which provides food for corals, while corals get oxygen and nutrients. (Mutualism)
6. Lions compete for gazelles. (Competition)

4 What happens when:

1. Food sources lack in a balanced ecosystem?
The competition increases between the individuals of the same species, which negatively impacts their growth or survival.
2. Food shortage occurs for a group of hyenas?
The competition happens between them, which negatively impacts their growth or survival.
3. One of the living organisms present in a balanced ecosystem is absent?
The other living organisms in the food chain or the food web are affected, which causes an imbalance for the ecosystem.
4. The number of primary consumers increases?
 - The number of producers decreases.
 - The number of secondary consumers increases.
5. The number of secondary consumers decreases?
 - The number of primary consumers increases.
 - The number of tertiary consumers decreases.

5 Study the figures below, then answer the following questions:



(1)



(2)



(3)



(4)

- a.** Which of these creatures is a carnivore, omnivore, herbivore, or scavenger?

The lion is a carnivore, the bear is an omnivore, the horse is a herbivore, and the eagle is a scavenger.

- b.** Compare between the lion and the horse in terms of:
Type of food – Shape of the teeth

P.O.C	Lion	Horse
a. Type of Food	Animals (Meat)	Plants only
b. Shape of the Teeth	Sharp canines	Incisors

6 The following figure shows a living organism. Answer the questions below:

- a.** What is the name of this organism?

Dotted beetle (Lady bug)

- b.** What organisms does it feed on?

It feeds on aphid insects.

- c.** What is the benefit of this organism to the environment?

It is used to eliminate agricultural pests instead of using pesticides.





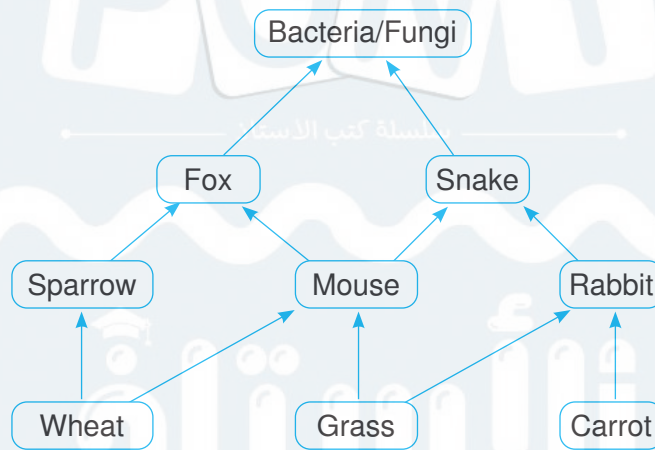
7 Create food chains and a food web from the following organisms:

Carrot – Shrimp – Grass – Seal – Wheat – Deer – Mouse – Rabbit – Bacteria –
Fungi – Sparrow – Fox – Falcon – Snake – Fish – Bear – Algae – Lion

Food chains:

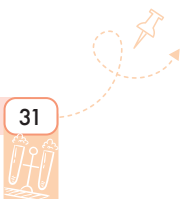
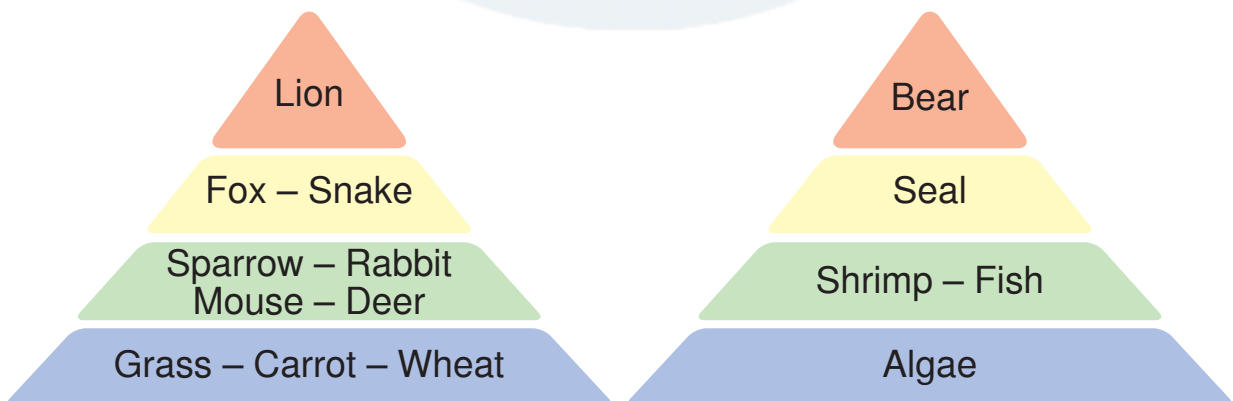
- 1) Carrot → Rabbit → Snake → Bacteria
- 2) Grass → Mouse → Snake → Bacteria
- 3) Wheat → Mouse → Fox → Bacteria
- 4) Algae → Shrimp → Fish → Seal → Bear → Fungi

Food web:



8 Create an energy pyramid from the following:

Carrot – Shrimp – Grass – Seal – Wheat – Deer – Mouse – Rabbit – Sparrow –
Fox – Falcon – Snake – Fish – Bear – Algae – Lion



1 Put (✓) or (X):

1. Inherited traits are those passed from offspring to parents. (X)
2. The brown eye color is an acquired trait. (X)
3. The presence of a solid body structure covering the turtle is an inherited trait. (✓)
4. Instinctive behaviors are passed from parents to offspring without learning. (✓)
5. Acquired traits are not inherited and are acquired by humans from the environment. (✓)
6. Breastfeeding is an acquired trait. (X)
7. The genetic material is found in the cytoplasm of the eukaryotes. (X)
8. Chromosomes are thread-like bodies found inside the nucleus in the bean plant. (✓)
9. A chromosome consists of two strands, each of which is called a chromatid. (✓)
10. The number of chromosomes in humans is 46 chromosomes, and in corn is 32 chromosomes. (X)
11. The chromosome is chemically composed of DNA and protein. (✓)
12. DNA is made up of small parts known as nucleotides. (✓)
13. Spontaneous mutation occurs without human intervention. (✓)
14. Production of featherless chickens is considered induced mutation. (✓)
15. Scoliosis (spinal deformity) is a lethal mutation. (X)
16. Severe muscle atrophy and weakness is a lethal mutation. (✓)
17. The light skin color of people living in cold regions is a beneficial mutation. (✓)
18. Production of cube-shaped watermelons is an example of induced mutations. (X)
19. People who suffer from lactose intolerance experience cramps and nausea when they eat meat. (X)
20. Beneficial mutations cause the appearance of desirable traits. (✓)



2 Complete the following sentences:

1. The genetic material is found in the cytoplasm of prokaryotic organisms, and in the nuclei of eukaryotic organisms.
2. Examples of hereditary traits in humans are eye colors and hair colors.
3. Examples of acquired traits in humans are learning languages and learning to walk.
4. A hen sitting on eggs is an example of a/an instinctive behavior, while a dolphin playing with a ball is a/an acquired trait.
5. Chromosomes are found in a thread shape inside the nucleus.
6. Genetic traits are passed from parents to offspring through chromosomes.
7. A chromosome is made up of two chromatids connected at the centromere.
8. The chromosome chemically consists of nucleic acid and a protein known as histones.
9. DNA is made up of small units called nucleotides.
10. Each gene consists of smaller units called nucleotides.
11. Nucleotides exist in the form of two strands twisted around each other, and the two strands are called double helix.
12. Each chromosome carries thousands or millions of genes, which vary in number from one chromosome to another in the cells of the same individual.
13. The mixture used in separating a strawberry chromosome consists of dishwashing liquid and table salt with water.
14. Mendel is considered the founder of genetics, and he conducted his experiments on the pea plant.
15. The scientists Beadle and Tatum arrived at a working hypothesis for expressing genetic traits and it is known as one gene – one enzyme.
16. Genes produce enzymes, which are responsible for a chemical reaction that leads to the formation of protein, showing the genetic trait.
17. Spinal curvature is a result of harmful mutations, while muscular dystrophy is a result of lethal mutations.





18. The production of seedless lemons is a result of **beneficial** mutations.

3 Give one example of each of the following:

1. A hereditary trait in humans. (Eye colors – Hair colors)
2. An acquired trait in a horse. (A horse jumping over obstacles)
3. An instinctive behavior in a chicken. (A chicken incubating its eggs)
4. A spontaneous mutation in humans. (Albino child)
5. An induced mutation in chickens. (Featherless chicken)
6. A beneficial mutation in humans. (Light skin color in individual in cold regions)
7. A fatal (lethal) mutation in humans. (Muscular dystrophy)
8. A harmful mutation in humans. (Spinal deformity)
9. An alternative to butter for a person suffering from lactose intolerance. (Olive oil)
10. An alternative to milk for a person suffering from lactose intolerance. (Soya milk)
11. An alternative to chocolate milk for a person suffering from lactose intolerance. (Dark chocolate)

4 Classify the following as hereditary traits, acquired traits, or instinctive behaviors:

1. Reading and writing (Acquired traits)
2. The length of a giraffe's neck (Hereditary traits)
3. The squirrel breaking the shell of a nut (Instinctive behaviors)
4. Learning to swim (Acquired traits)
5. The spider weaving its net (Instinctive behaviors)
6. The short legs of the Arctic fox (Hereditary traits)
7. Learning Hindi (Acquired traits)
8. Birds incubating eggs (Instinctive behaviors)
9. Horses jumping hurdles (Acquired traits)



10. Facial freckles (Hereditary traits)
11. Breastfeeding (Instinctive behaviors)
12. Blood type (Hereditary traits)
13. The dolphin playing with a ball (Acquired traits)
14. The bat sleeping upside down (Instinctive behaviors)
15. Hair color (Hereditary traits)

5 Compare between:

1. Hereditary traits and acquired traits, in terms of: Definition – Examples

P.O.C	Hereditary Traits	Acquired Traits
a. Definition	They are traits transmitted from parents to offspring without learning.	They are traits that are not inherited from parents, but are acquired from the surrounding environment through learning or training.
b. Examples	- Eye colors - Hair colors	- Learning languages - Learning to walk

2. Acquired traits and instinctive behaviors, in terms of: Definition – Examples

P.O.C	Acquired Traits	Instinctive Behaviors
a. Definition	They are traits that are not inherited from parents, but are acquired from the surrounding environment through learning or training	They are behaviors and skills that are transmitted from parents to offspring without learning.
b. Examples	- Learning languages - Learning to walk	- A bat sleeping upside down - A bird building its nest

3. Spontaneous mutation and induced mutation in terms of: Definition -

Examples

P.O.C	Spontaneous Mutation	Induced Mutation
a. Definition	It occurs naturally, without human intervention.	It occurs through human intervention.
b. Examples	Albino child	Featherless chicken

4. Harmful mutation and lethal mutation in terms of examples

P.O.C	Harmful Mutation	Lethal Mutation
Examples	Spinal deformity (curved spine)	Muscular dystrophy

6 What is meant by each of the following?

1. Genetics

It is the science that studies the transmission of genetic traits from parents to offspring.

2. Inherited traits

They are traits transmitted from parents to offspring without learning.

3. Instinctive behaviors

They are behaviors and skills that are transmitted from parents to offspring without learning.

4. Acquired traits

They are traits that are not inherited from parents, but are acquired from the surrounding environment through learning or training.

5. Chromosomes

They are thread-like bodies that represent the genetic material of living organisms.

6. Centromere

It is a central point that connects the two chromatids of the chromosome together.

7. Mutation

It is the emergence of new hereditary trait that did not previously

exist, resulting from a change in the nature of the responsible gene.

8. Spontaneous mutations

They are mutations that occur naturally, without human intervention.

9. Induced mutations

They are mutations that occur through human intervention.

7 Give reasons for:

1. The genes found on a single chromosome are different.

Due to the difference in the sequence of nucleotides in the DNA.

2. DNA is known as a double helix.

Because the genes are arranged in the form of two strands twisted around each other, forming double helix.

3. Smooth hair is considered a hereditary trait, while learning to swim is an acquired trait.

Because smooth hair is a trait that is transmitted from parents to offspring without learning, while learning to swim is not inherited from parents, but is acquired through learning or training.

4. A squirrel breaking a nut is considered an instinctive behavior.

Because it is a behavior that is transmitted from parents to offspring without learning.

5. Mendel is considered the founder of genetics.

He concluded that each hereditary trait is controlled by a pair of genetic factors, known as genes.

6. Genes are considered responsible for the appearance of hereditary traits.

Each gene produces an enzyme that is responsible for the occurrence of a chemical reaction, leading to the formation of a protein that expresses a specific hereditary trait.

7. A dark-skinned mother giving birth to an albino child is considered a spontaneous mutation.

Because it occurs naturally without human intervention.

8. Light skin color in people living in cold regions is a beneficial spontaneous mutation.



Because it is a mutation that occurs naturally, which helps them to absorb vitamin D better.

9. Producing cube-shaped watermelons is considered an agricultural technique and not a mutation.

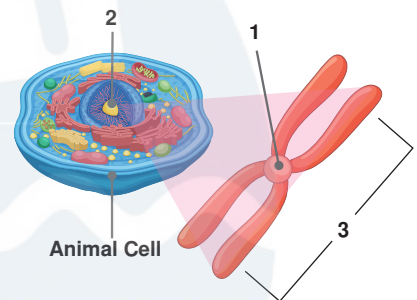
Because watermelons are placed in a square mold during its growth to facilitate its transportation.

10. Lactose tolerance is considered a beneficial mutation.

Because they can convert lactose sugar into simple sugars, which are easier for the body to absorb.

8 Complete the data on the drawing:

1. Centromere
2. Nucleus
3. Chromosomes



Determine the location of number (3) in bacteria and rabbits.

- In bacteria, chromosomes are found in the cytoplasm.
- In rabbits, chromosomes are found in the nucleus.

9 What are the consequences of:

1. A difference in the order of nucleotides in a single chromosome?

This results in a change in the nature of the gene, leading to a change in the hereditary trait and the emergence of a new trait that did not previously exist known as mutation.

2. The formation of genes for certain enzymes?

- Each gene produces an enzyme.
- This enzyme is responsible for the occurrence of a chemical reaction.
- This chemical reaction leads to the formation of a protein.
- The protein expresses a specific hereditary trait.

3. Muscle atrophy and weakness in newborns?

A lethal mutation is a harmful genetic change that leads to severe



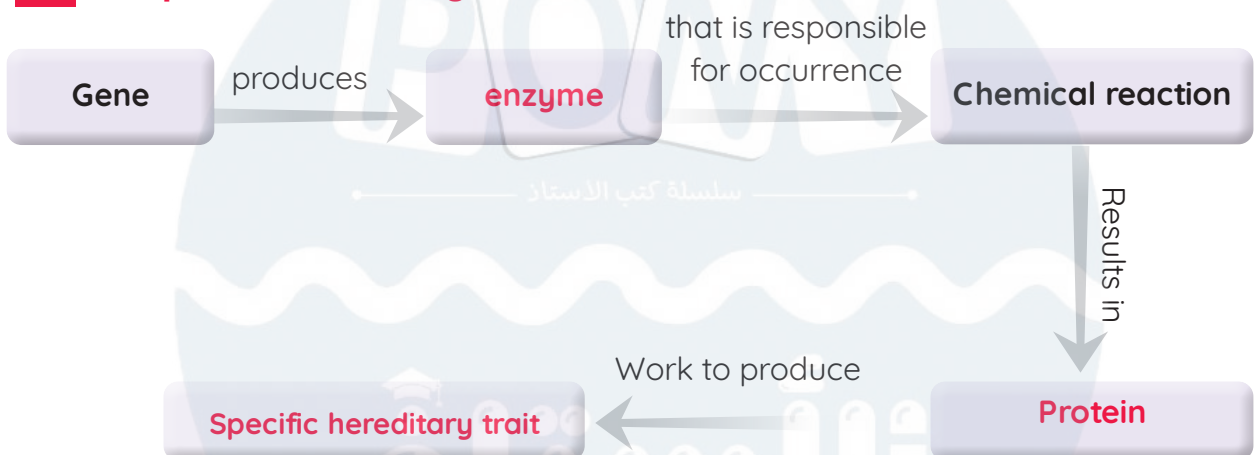
muscle wasting and weakness.

4. Placing watermelons in square-shaped metal molds when they grow?
They will take a square shape to facilitate their transportation.

10 What is the benefit of genes?

Genes are responsible for the appearance of hereditary traits in living organisms.

11 Complete the following chart:



12 From the opposite figure:

1. What is this child known as?
Albino child
2. What is the reason for the child being born in this way?

Due to spontaneous mutation.



1 Put (✓) or (x):

1. The importance of the water cycle in nature is the renewal of water resources. (✓)
2. Water evaporates when it cools. (x)
3. Water is used in many fields, including agriculture and industry. (✓)
4. The higher the temperature of water vapor, the faster the condensation. (x)
5. There are many forms of precipitation, such as rain, snow, and hail. (✓)
6. Evaporation of water occurs when it comes into contact with a cold surface. (x)
7. Winds move clouds containing heavier or smaller water droplets. (x)

2 Complete the following sentences:

1. Water exists in three states, which are liquid, solid, and gas.
2. Water changes from the liquid state to the gaseous state when it gains thermal energy.
3. Water changes from the gaseous state to the liquid state when it loses heat in a process known as condensation.
4. Sources of water vapor in nature include bodies of water, transpiration, and sweat of humans and animals.
5. Groundwater is stored beneath the Earth's surface.
6. The basic stages of the water cycle are evaporation, condensation, precipitation, surface runoff, and infiltration.

3 Compare between:

1. Infiltration and surface runoff

Infiltration	Surface Runoff
It is a process in which a portion of water infiltrates into the ground and is stored as groundwater.	It is a process in which rainwater flows across the Earth's surface into rivers and lakes, then into oceans or seas.

2. Evaporation and transpiration

Evaporation	Transpiration
It is the change of water upon gaining heat from the liquid state to the gaseous state at any temperature.	It is the process by which plants lose water in the form of water vapor.

4 Choose from column (B) what suits it in column (A) :

Column (A)	Column (B)
1. The percentage of water in the human body.	a. 3%
2. The percentage of fresh water compared to the percentage of water on the Earth's surface.	b. 97%
3. The percentage of land in the Earth's composition.	c. 71%
4. The percentage of salt water compared to the percentage of water on the Earth's surface.	d. 29%
5. The percentage of water in the Earth's composition.	e. 70%
1. e 2. a 3. d 4. b 5. c	

5 What is meant by each of the following:

1. Evaporation

It is the change of water upon gaining heat from the liquid state to the gaseous state at any temperature.

2. Boiling

It is the change of water upon gaining heat from the liquid state to the gaseous state at a specific temperature, and it occurs to all molecules of water.

3. Condensation

It is a process in which water changes from the gaseous state to the liquid state by losing heat at any temperature.

4. The water cycle

It is a natural process that involves the movement of water between the atmosphere and Earth in a closed, multi-path cycle.



5. Transpiration process

It is the process by which plants lose water in the form of water vapor.

6 State the importance of:

1. Water

Humans use water in many fields, such as drinking, agriculture, industry, and sanitation.

2. The Sun in the water cycle in nature

The Sun causes water to evaporate from the Earth to the atmosphere.

3. Gravity in the water cycle in nature

Gravity causes water to return from the clouds to the Earth.

4. Wind in the water cycle in nature

Wind moves accumulated water droplets to form clouds.

5. The water cycle

The water in bodies of water is renewed through the continuity of the water cycle.

7 Give reasons for the following:

1. Fresh water consumption must be rationalized. _____

To ensure the sustainability of fresh water in the future.

2. Water droplets form on the outer surface of a cup containing water and ice cubes.

Due to the condensation of water vapor in the air, forming water droplets on the outer surface of the cup.

3. The Sun and gravity maintain the continuity of the water cycle.

Because the Sun causes water to move from the Earth to the atmospheric air, while gravity causes water to return from the clouds to the Earth's surface during precipitation.

4. Sea and ocean water are desalinated.

To face the shortage of freshwater resources suitable for drinking, irrigation, ... etc.





8 What are the results of:

1. Placing a cup of water in a sunny place for several hours?

Water evaporates and changes from the liquid state into the gaseous state.

2. Placing pieces of ice in a cup of water?

Water droplets form on the outer surface of the cup due to the condensation process.

3. The water cycle stopping suddenly?

Water isn't renewed continuously in nature.

4. The cloud temperature being below the freezing point?

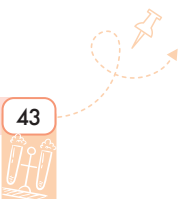
Snow precipitates instead of rain.

5. Small ice crystals gathering during thunderstorms?

Hail precipitates instead of rain.

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1 Put (✓) or (X):

1. Rocks are solid bodies composed of only one mineral. (X)
2. Rocks are classified into three types: sedimentary, igneous, and calcareous. (X)
3. Only chemical changes lead to geological processes in rocks. (X)
4. Weathering is the process of disintegrating and breaking down rocks. (✓)
5. Mechanical weathering is the process of disintegrating and breaking rocks without a change in their chemical composition. (✓)
6. Chemical weathering is the process of disintegrating and breaking rocks with a change in their properties. (✓)
7. Freezing of water in rock cracks causes the rocks to freeze. (X)
8. Yellowstone National Park is a good example of chemical weathering. (✓)
9. Calcium carbonate powder is used to make casts for broken bones. (✓)

2 Complete the following sentences:

1. Rocks are classified into three types: sedimentary rocks, metamorphic rocks, and igneous rocks.
2. The freezing of water in cracks is one of the causes of mechanical weathering.
3. The freezing of water in cracks, wind blowing, and the thermal expansion and contraction of the minerals forming the rocks are among the causes of mechanical weathering.
4. Spherical weathering is a form of chemical weathering.
5. Limestone rocks and sandstone rocks are examples of sedimentary rocks.
6. Chemical substances, such as acids and the mineral materials present in groundwater, cause chemical weathering.
7. Calcium carbonate powder is used in making casts used for patients with bone fractures.
8. Sedimentary rocks are characterized by being porous and containing fossils.

9. When sedimentary rocks are exposed to pressure and heat, they transform into metamorphic rocks.
10. When limestone rocks are exposed to heat and pressure, they transform into marble.
11. When sandstone rocks are exposed to heat and pressure, they transform into quartzite rocks.
12. Igneous rocks are classified into two types: plutonic igneous rocks and surface igneous rocks.
13. Examples of metamorphic rocks are limestone and sandstone.
14. Basalt rocks and pumice are surface igneous rocks.
15. Granite and gabbro are plutonic igneous rocks.
16. When sediments are exposed to compaction and lithification, they transform into sedimentary rocks.
17. When igneous rocks are exposed to weathering and erosion, they transform into sediments.
18. Metamorphic rocks form when limestone and sandstone rocks are exposed to heat and pressure.
19. Plants represent the organic source for the formation of coal, while marine microorganisms represent the organic source for the formation of petroleum.
20. Natural gas is composed of methane, which makes up 90% of its components.

3 Which of the following rocks are sedimentary, igneous, or metamorphic rocks?

- | | |
|--------------|--------------------|
| 1. Granite | (Igneous rock) |
| 2. Marble | (Metamorphic rock) |
| 3. Limestone | (Sedimentary rock) |
| 4. Pumice | (Igneous rock) |
| 5. Basalt | (Igneous rock) |
| 6. Claystone | (Sedimentary rock) |
| 7. Gabbro | (Igneous rock) |

8. Quartzite

(Metamorphic rock)

9. Sandstone

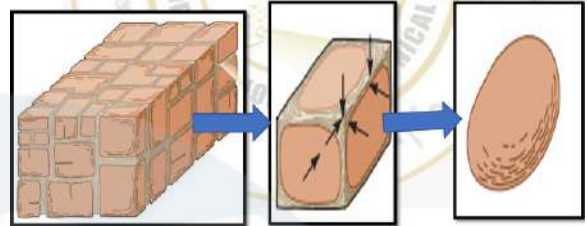
(Sedimentary rock)

4 The following figure shows the formation of some rocks through chemical weathering, answer:

1. What is the name of weathering?

Spherical weathering

2. Mention how it occurs.



Granite blocks are subjected to chemical weathering, so the corners weather more quickly, and the rock turns into a spherical shape.

5 What are the rocks that can be transformed from one type to another?

- Limestone changes into marble by heat and pressure.
- Sandstone changes into quartzite by heat and pressure

6 What are the geological processes that occur to form rocks over the ages?

Weathering and erosion, extreme pressure and heat, melting and cooling (rock cycle)

7 Compare between each the following:

1. Sedimentary, metamorphic, and igneous rocks, in terms of: Method of formation – Examples.

P.O.C	Sedimentary rocks	Metamorphic rocks	Metamorphic rocks
a. Method of formation	They are cohesive rocks formed through the lithification of sediments.	They are rocks that are formed when rocks under the Earth's surface are subjected to pressure and heat without reaching the melting point.	They are rocks formed as a result of the cooling of magma in the cracks and layers within the Earth's crust or cooling of lava on the Earth's surface.
b. Examples	Limestone rocks Sandstone rocks	Marble Quartzite	Granite – Gabbro Basalt – Pumice

2. Plutonic and surface igneous rocks, in terms of: Method of formation – Crystal size – Examples.

P.O.C	Plutonic igneous rocks	Surface igneous rocks
a. Method of formation	They are formed when the magma between the cracks and layers of the Earth cools very slowly.	They are formed when the lava on the Earth's surface cools very quickly.
b. Crystal size	Large crystals	Small crystals
c. Examples	Granite – Gabbro	Basalt – Pumice

8 What is meant by each of the following:

1. Rocks

They are solid materials composed of one or several minerals.

2. Weathering

It is the process of breaking down and fragmenting the rocks, which may take millions of years.

3. Mechanical weathering

It is the process of breaking down and fragmenting the rocks without any change in their chemical structure.

4. Chemical weathering

It is the process of breaking down and fragmenting the rocks with a change in their chemical structure.

5. Erosion

It is the process of transportation and sedimentation of rock fragments, resulting from weathering, away from the areas where they were originally found.

6. Lithification

It is the process of compaction of sediments over years into layers, forming sedimentary rocks.



7. Sediments

They are fragments of rocks that have been eroded from the area where the weathering process occurred.

8. Sedimentary rocks

They are cohesive rocks formed through the lithification of sediments.

9. Magma

It is a very hot molten material formed from the melting of minerals that make up some rocks in the Earth's interior.

10. Lava

It is the magma when it reaches the Earth's surface.

11. Rock cycle

It is the transformation of rocks from one type to another through several processes, such as weathering and erosion, extreme pressure and heat, and melting and cooling.

12. Fossil fuel

It is a fuel that formed millions of years ago as a result of a series of physical and chemical changes of organic substances in the Earth's interior.

9 State the importance of:

1. Marble

It is used in the construction of the Taj Mahal in India.

2. Limestone rock powder

Limestone rock powder is used to make casts for individuals with bone fractures.

10 Give reasons for:

1. Yellowstone National Park is an example of chemical weathering.

Because it causes the breaking down of rock with a change in chemical structure by mineral-rich hot water.



2. The water coming from Ethiopia appears brown.

Because this water transports gravel, sand, silt, and clay, which result from the weathering process.

3. Erosion is both a beneficial and harmful process for the environment.

- Erosion has beneficial effects, such as the formation of agricultural soil in Egypt and river deltas.

- Erosion has harmful effects, such as coastal erosion due to sea waves.

4. Sedimentary rocks are characterized by being porous.

Due to the presence of spaces between the particles that compose them.

5. Sedimentary rocks are characterized by the presence of fossil.

Because sedimentary rocks protect the remains of old animals from decaying as they are formed through the lithification of sediments.

6. The crystals of surface igneous rocks are small.

Because surface igneous rocks are formed when the lava on the Earth's surface cools very quickly.

7. The crystals of plutonic igneous rocks are large.

Because plutonic igneous rocks are formed when the magma between the cracks and layers of the Earth's crust cools very slowly.

11 What happens when:

1. A glass bottle of water is filled to its top and placed in the refrigerator for several hours?

The bottle breaks due to the expansion of water as it freezes into ice.

2. Water freezes in the cracks between the rocks?

Its volume increases, causing the breaking down of the rocks (mechanical weathering).



3. Water flows between rocks?

Water freezes when the temperature decreases, so the cracks in the rocks become wider.

4. The temperature of the minerals that make up the rock rises during the day?

During the day, the temperature rises, causing the minerals inside the rocks to expand.

5. The temperature of the minerals that make up the rock decreases at night?

At night, the temperature decreases, causing the minerals inside the rocks to contract.

6. Plant roots grow within the cracks between rocks?

The cracks become wider and the rocks break down easily.

7. We add drops of hydrochloric acid to a piece of limestone?

The rock is eroded and gas bubbles are formed.

8. We bring a matchstick close to the gas produced by adding acid to the limestone?

The matchstick is turned off.

9. Limestone rocks are exposed to heat and pressure?

It changes into marble.

10. Magma comes out to the Earth's surface?

Lava cools very quickly, forming plutonic igneous rocks.

11. Magma interferes between the cracks and layers of the Earth?

Magma cools very slowly, forming surface igneous rocks.



12 What is the name of each figure?



1 Limestone rock



2 Sandstone rock



3 Marble



4 Granite



5 Basalt



6 Pumice



7 Gabbro



8 Quartzite

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



خطوة 1



خطوة 2
اختيار اسم
الطابعة
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خطوة 3
كتابة الصفحات
المراد طباعتها
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خطوة 4
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خطوة 5
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خطوة 6

حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

الترم الثاني



①

Write the scientific term:

Unit 1

1)	Elements that have metallic luster and are good conductors of heat and electricity.	(.....)
2)	Brittle elements in which the last energy level contains more than 4 electrons.	(.....)
3)	The attraction force between positive metal ions and the negative valence electron cloud which surrounds them.	(.....)
4)	A mixture composed of the melts of two metals or more.	(.....)
5)	An ion composed of more than one atom of more than one element.	(.....)
6)	A scientist who clarified that alkalis are substances that dissolve in water and give (produce) hydroxide ions.	(.....)
7)	A substance whose dissolution in water leads to an increase in the percentage of H^+ cations in the solution.	(.....)
8)	A substance whose dissolution in water leads to an increase in the percentage of OH^- anions in the solution.	(.....)
9)	Rains which result from the dissolution of acidic oxides in the atmospheric water vapour.	(.....)
10)	Chemical substances whose colour differs in acidic medium from that in alkaline medium.	(.....)
11)	An indicator that can differentiate between the different acids or the different alkalis according to their strength.	(.....)
12)	A Danish scientist who developed pH scale to differentiate between acidic, basic and neutral solutions.	(.....)
13)	A scale that ranges between the values 0 to 14, and is used to determine the acidity and the basicity of solutions.	(.....)
14)	Compounds, mostly ionic, formed from the combination of an alkali cation with an acid anion.	(.....)
15)	The set of points through which the object passes during its motion	(.....)
16)	The total length of any path taken by the object during its moving from the starting point to the end point.	(.....)
17)	The shortest straight path connecting between the starting point and the end point in a constant direction.	(.....)
18)	The distance covered per unit time.	(.....)

Unit 2

19)	The amount of energy required to move an object through a certain displacement in the same direction of the force acting on it.	(.....)
20)	The quotient of the work done divided over the displacement, which is estimated in newtons.	(.....)
21)	One of the skills in scientific research and designing scientific comparative experiments.	(.....)
22)	The variable which is changed during the experiments.	(.....)
23)	The variable to be tested which is being changed in response to changing the independent variable.	(.....)
24)	The ability to do work.	(.....)
25)	The energy stored in the object as a result of the work done on it.	(.....)
26)	The product of multiplying the mass of the object by the Earth's gravitational field intensity	(.....)
27)	The energy acquired by an object as a result of its motion.	(.....)
28)	The sum of the potential and the kinetic energies of any moving object.	(.....)
29)	Energy used in operating turbines to generate electricity from the High Dam.	(.....)
30)	A heavy tool used in demolishing old buildings as a result of the conversion of potential energy into kinetic energy.	(.....)
31)	Any place that includes living organisms and non-living (abiotic) components and includes several levels of organization.	(.....)
32)	The fundamental unit in the classification of the living organism.	(.....)
33)	The various biotic populations of different species that inhabit the same environment.	(.....)
34)	A group of individuals of the same species living in a particular place at the same time.	(.....)
35)	A nutritional relationship between two organisms, one of them benefits and the other is harmed.	(.....)
36)	A nutritional relationship between two individuals of the same species for a food source that exists in limited quantities.	(.....)

Unit 3

37)	A nutritional relationship between two organisms where both of them benefit from each other without causing harm to either of them.	(.....)
38)	A nutritional relationship between two organisms known as the commensal and the host.	(.....)
39)	Autotrophic organisms that can make their own food through the photosynthesis is process.	(.....)
40)	Animals that depend on the producers to obtain their food.	(.....)
41)	Consumers that feed on plants and animals.	(.....)
42)	Consumers that feed on the remain of dead organisms.	(.....)
43)	Organisms that obtain energy from the breaking down of the organic substances found in dead bodies.	(.....)
44)	The path of energy flow in the form of food as it moves from one living organism to another within the ecosystem.	(.....)
45)	A method in which food systems utilize living organ agricultural pests instead of using pesticides, living organisms to eliminate	(.....)
46)	The interconnection and overlapping of multiple food chains together.	(.....)
47)	A pyramid represents the flow of energy and its amounts between different trophic levels in any food chain.	(.....)
48)	Traits that are inherited from one generation to the next.	(.....)
49)	Traits that are not inherited from parents to offspring but are acquired from the surrounding environment through learning or training.	(.....)
50)	Behaviors and skills that are transmitted from parents to offspring without learning.	(.....)
51)	A vital process aims to produce new individuals resembling their parents.	(.....)
52)	Thread-like bodies representing the genetic material of the eukaryotic organism.	(.....)
53)	The central point at which the two chromatids of the chromosome are connected.	(.....)
54)	Segments of the nucleic acid DNA found in chromosomes, responsible for the appearance of the hereditary traits in the living organism.	(.....)
55)	The smallest building unit of the nucleic acid DNA	(.....)

56)	The science that studies the transmission of genetic traits from parents to offspring.	(.....)
57)	Each gene produces a specific enzyme responsible for occurrence of a chemical reaction that leads to the formation of a protein that expresses a specific hereditary trait.	(.....)
58)	The emergence of a new hereditary trait that did not previously exist, as a result of a change in the nature of the gene responsible for it.	(.....)
59)	Mutations that occur naturally without human intervention.	(.....)
60)	Mutations that occur through human intervention.	(.....)
61)	Mutations that cause the appearance of new undesirable traits, some of them may lead to death.	(.....)
62)	Mutations that cause the appearance of new desirable traits, whether occurring naturally or through human intervention.	(.....)
63)	The conversion of water from the liquid state to the gaseous state upon gaining heat.	(.....)
64)	The conversion of water from the gaseous state to the liquid state upon losing heat.	(.....)
65)	The conversion of water from the liquid state to the solid state upon losing heat.	(.....)
66)	A natural process involving the movement of water between the atmospheric air and the earth in a closed multi-path cycle.	(.....)
67)	The process of water loss from plants in form of water vapour.	(.....)
68)	The process of falling of water from clouds to the Earth's surface in form of rain, snow or hail due to the effect of the Earth's gravity.	(.....)
69)	The process of rainwater flowing across the Earth's surface and into rivers, seas and lakes due to the effect of the Earth's gravity.	(.....)
70)	The process of removing dissolved salts from seawater.	(.....)
71)	Solid materials composed of one or several minerals.	(.....)
72)	The process of breaking down and fragmenting rocks, that may take millions of years.	(.....)
73)	The process of breaking down and fragmenting rocks without any change in their chemical structure.	(.....)

Unit 4

74)	The process of breaking down and fragmenting rocks with a change in their chemical structure.	(.....)
75)	Chemical weathering that leads to the formation of spheres of rocks.	(.....)
76)	The processes of transportation and sedimentation of the rock fragments which resulting from weathering away from the areas where they were originally found.	(.....)
77)	Rock fragments transported away from the area in which weathering occurred.	(.....)
78)	Cohesive rocks formed from the lithification of sediments.	(.....)
79)	The rocks formed through the exposure of rocks located beneath the Earth's surface to extreme pressure and heat without reaching their melting point.	(.....)
80)	Molten rocks in the Earth's interior.	(.....)
81)	Magma when it reaches the Earth's surface.	(.....)
82)	Rocks formed from the solidification of lava or magma.	(.....)
83)	Rocks formed from the slow cooling of magma in the cracks of the Earth's crust.	(.....)
84)	Rocks formed from the rapid cooling of lava on the surface of the Earth's crust.	(.....)
85)	The transformation of rocks from one type to another through several processes.	(.....)
86)	The fuel formed in the Earth's interior.	(.....)

②

complete the following sentence

Unit 1

1)	All metals are solid substances except is a liquid
2)	All non-metals are poor conductors of electricity except which is a good conductor of electricity.
3)	The atoms of solid metals are arranged in a pattern known as
4)	The metallic bond is occurs as a result of the attraction force between positive metal and the surrounding negative cloud.
5)	Bronze alloy is composed of 5% and 95% And characterized by being more than copper and its for rusting.
6)	Lactic acid supplies muscles with .....,When oxygen is deficient and accumulates in the muscles, it causes

7)	The scientist explained that acids are substances that dissolve in water and give positive ions, while alkalis give negative ion when dissolved in water.
8)	Lemon and ketchup are considered substances, while toothpaste and baking soda are substances.
9)	Nitric acid is considered a acid, while nitrous acid and sulphurous acid are acids.
10)	Metals burn in an oxygen atmosphere and form most of them are known as oxides while non-metals burn in an oxygen atmosphere and form most of them are known as oxides
11)	The dissolution of sulphur trioxide in water produces
12)	Melting in water produces magnesium hydroxide
13)	The combustion of fossil fuels produces oxides and
14)	 chemicals that change colour in an acidic medium compared to a basic medium, such as
15)	We reduce soil acidity by adding substances such as
16)	The hydrogen number is accurately measured using
17)	Acidic gases and while basic gases
18)	Neutral gases on litmus paper are and
19)	Produced by the reaction of acids with alkali and
20)	Copper sulphate salt is in colour, while salt is white in colour.
21)	The measuring unit of distance and displacement , ,
22)	The measuring unit of speed and
23)	The measuring unit of work and while the newton is the measuring unit of
24)	 = force $\times$ displacement
25)	Factors affecting potential energy are and
26)	The measuring unit of weight
27)	5 km m, 3kJ = J
28)	Energy is measured in units of and work is measured in units of
29)	Mass is measured in units of and weight is measured in units of
30)	The work done is directly proportional to and
31)	Factors affecting the kinetic energy of a body and
32)	The unit of measurement for kinetic energy is and is equal to $\times$

Unit 2

33)	The kinetic energy of a body = x
34)	Kinetic energy is directly proportional to the mass and
35)	The greater the mass of a body, the speed of the body when the kinetic energy is constant.
36)	If the speed of an object decreases to half with constant mass, its kinetic energy
37)	When an object falls downwards, potential energy and
38)	The mass of an object is measured in units of, while its speed is measured in units of
39)	When the speed of a body increases three times, its kinetic energy increases times its original value.
40)	The Predation is a nutritional relationship between two individuals, one of them called and the other called prey.
41)	The Predator is the individual that from the predation relationship.
42)	The Prey is the individual that is or its life in the predation relationship.
43)	The Competition is a nutritional relationship between two individuals of the same for a food resource that exists in quantities, which impacts their growth or survival.
44)	The Mutualism is a nutritional relationship between two individuals, both of them from each other without causing to either of them.
45)	The commensalism is a nutritional relationship between two individuals, one of them and the other neither nor
46)	The ecosystem consists of and
47)	Non-living components such as,, and
48)	The ecosystem consists of several levels: the individual, and
49)	 is considered the basic unit in the classification of living organisms.
50)	Each stage in which energy is transferred in the food chain is called
51)	The rabbit and the horse are considered because they have for cutting plants.
52)	Carnivorous animals such as and are characterized by having sharp canines to their preys.

Unit 3

53)	Omnivorous animals such as and feed on both meat and plants.
54)	Hyanas and eagles are considered, as they feed on the remains of dead organisms.
55)	Each gene consists of smaller units called
56)	Nucleotides exist in the form of twisted around each other, and called
57)	Each chromosome carries thousands or millions of which vary in number from one chromosome to another in the cells of the same individual.
58)	The chromosome consists of which are connected at
59)	The chromosome is chemically composed of and protein known as
60)	The nucleic acid is made up of small segments Called
61)	The mixture used in separating strawberry chromosomes consists of and with
62)	 is considered the founder of genetics, and he conducted his experiments on the plant.
63)	The scientists and affirmed hypothesis for expressing genetic traits and called it
64)	Genes produce which is responsible for a chemical reaction that leads to the formation of, showing the genetic trait.
65)	Spinal curvature is a result of mutations.
66)	The production of seedless lemons is a result of mutations.
67)	The main source of energy on Earth's surface is
68)	The food chain begins with a organism and ends with a organism.
69)	Fungi are considered, organisms, while are herbivores.
70)	Both living organisms are not harmed in a relationship.
71)	The point where the two chromatids of the chromosomes are connected is called
72)	The two scientists who, affirmed the one gene-one enzyme hypothesis through their experiments , are and
73)	Genetic material is found in prokaryotic organisms.
74)	The production of seedless fruits is considered a mutation.
75)	A gene produces is responsible for a specific chemical reaction.

76)	The number of chromosomes in human skin cells is chromosome
77)	The albino mutation is mutation .
78)	Behaviors and skills that are passed from parents to offspring without learning are and
79)	The short legs of Arctic fox is a trait, while the taming lions is a .....trait
80)	DNA is composed of small segments called ,each of them consists of a sequence of
81)	The genetic material is found in of prokaryotic organisms and in of eukaryotic organisms
82)	Examples of hereditary traits in humans are and
83)	Examples of acquired traits in humans are and
84)	A hen sitting on eggs is an example of a(n) behavior, while a dolphin playing with a ball is a(n) trait
85)	Chromosomes are found in a shape inside the nucleus
86)	Genetic traits are passed from parents to offspring through
87)	The scientists Beadle and Tatum concluded that each gene is responsible for producing which is responsible for the formation of
88)	The science that studies the transmission of genetic traits from parents to offspring is
89)	 is considered the founder of the science of genetics.
90)	The scientists and affirmed the hypothesis through their experiments.
91)	One gene- one enzyme hypothesis states that each produce a ,which is responsible for the occurrence of a that leads to the formation of a that expresses a specific trait.
92)	Water exists in three states ,solid and
93)	Water changes from a liquid state to a state when it gains
94)	Water changes from a gaseous state to a liquid state at temperature in a process known as
95)	Sources of water vapor in nature include , , and
96)	Water is stored underground.
97)	The basic stages of the water cycle are , , , surface runoff, and

Unit 4

- 98) Rocks are classified into three types are and
- 99) Water freezing in cracks is one of the causes of that leads to the breaking of rocks.
- 100) Water freezing in cracks, and the thermal expansion and contraction of the minerals that make up rocks are causes of mechanical weathering.
- 101) Spherical weathering is one of form
- 102) and are examples of sedimentary rocks.
- 103) Chemical substances such as and minerals found in groundwater cause chemical weathering.
- 104) Powdered of is used to make casts for people with broken bones.
- 105) Sedimentary rocks are characterized by being and containing
- 106) When sedimentary rocks are exposed to and they turn into metamorphic rocks.
- 107) When limestone rocks are exposed to heat and pressure, they turn into
- 108) When rocks are exposed to heat and pressure, they turn into quartzite rock.
- 109) Igneous rocks are classified into two types: and
- 110) Examples of metamorphic rocks are and
- 111) Basalt and / are igneous rocks.
- 112) and are plutonic igneous rocks.
- 113) When sediments are subjected to compression and lithification, they turn into
- 114) When igneous rocks are subjected to and, they turn into sediments
- 115) Metamorphic rocks are formed when rocks and are exposed to heat and pressure
- 116) Natural gas is composed of and represents 90% of its components.
- 117) is the process of breaking down and fragmenting rocks, while is the transport of sediments from one location and their sedimentation in another
- 118) Basalt is an igneous rock, while granite is an Igneous rock

3

give reason for (scientific explanation)

Unit 1

- 1) Calcium ($_{20}\text{Ca}$) is metal while Chlorine ($_{17}\text{Cl}$) is non-metal.
.....
- 2) Carbon is used in the manufacture of dry columns even though it is not a metal.
.....
- 3) Calcium ($_{20}\text{Ca}$) is harder than sodium ($_{11}\text{Na}$).
.....
- 4) Bronze alloy is used in the manufacture of medals instead of copper.
.....
- 5) Magnesium milk is used to treat stomach acidity.
.....
- 6) Litmus paper is not suitable for distinguishing between strong and weak acids.
.....
- 7) Distilled water does not affect litmus paper.
.....
- 8) A pH meter is more accurate than universal strips in determining the pH value of a solution.
.....
- 9) It cannot sink in the Dead Sea.
.....
- 10) Metals are good conductors of electricity.
.....
- 11) Calcium is added to acidic soil.
.....
- 12) The color of hydrangea flowers changes depending on the type of soil.
.....
- 13) Chemical indicators only work in the presence of water.
.....
- 14) Occurrence of acid rain occurs.
.....
- 15) Hydrochloric acid is used in the digestion of food.
.....

16) Muscle tension occurs when there is a lack of oxygen in the muscles.

17) Copper is used in the manufacture of electrical wires.

18) Most alloys are not expressed in molecular form.

19) The speed of the moving object decreases if it required longer time to cover the same distance.

Unit 2

20) When the speed of an object increases, the covered distance at the same time increases.

21) A person pushing against a wall does not perform work.

22) A person pushing a shopping cart performs work.

23) The role of fuel within a car is similar to the role of food within a living organism.

24) The work done by a passenger car is less than the work done by a truck, even though they travel at the same speed.

25) The work required to stop a car moving at high speed increases.

26) The gravitational potential energy decreases when an object falls.

27) The mechanical energy remains constant while the object falls in the absence of friction.

28) The kinetic energy of the object = zero at maximum height.

29) The work required to move a car increases as its mass increases.

30) The High Dam has great importance in generating electricity in Egypt.

31) The mechanical energy of any object is a constant quantity that does not change.

32) The genes found on a single chromosome are different.

Unit 3

33) DNA is known as a double helix.

34) Smooth hair is considered a hereditary trait, while learning to swim is an acquired trait.

35) A squirrel breaking a nut is considered an instinctive behaviour.

36) Mendel is considered the founder of genetics.

37) Genes are considered responsible for the appearance of hereditary traits

38) A dark-skinned mother giving birth to an albino child is considered a spontaneous mutation

39) Light skin color in people living in cold regions is a beneficial spontaneous mutation

40) Producing cube-shaped watermelons is considered an agricultural technique and not a mutation

41) Lactose tolerance is considered a beneficial mutation

42) The production of featherless chickens is a beneficial induced mutation.

43) Eye color is considered a Genetic trait, while learning to walk is an acquired trait.

44) Genes control the appearance of an individual's genetic traits.

.....

45) Fresh water consumption must be rationalized.

.....

Unit 4

46) Water droplets form on the outside of a cup containing water and ice cubes.

.....

47) The sun and gravity together maintain the continuity of the water cycle.

.....

48) Some countries carry out desalination of sea and ocean water.

.....

49) Yellowstone National Park is an example of chemical weathering.

.....

50) Water coming from Ethiopia appears brown.

.....

51) Erosion is both beneficial and harmful to the environment.

.....

52) Sedimentary rocks are characterized by their porosity.

.....

53) Sedimentary rocks are porous.

.....

54) Sedimentary rocks are characterized by the presence of fossils.

.....

55) The crystals of surface igneous rocks are small.

.....

56) The crystals of underground igneous rocks are large.

.....

4

what can be observed when(what happen if)

Unit 1

- 1) Hammering a piece of graphite
.....
- 2) Increasing the number of valence electrons in metal atoms relative to the metallic bond
.....
- 3) Mixing molten gold with molten copper.
.....
- 4) Passing an electric current through sulphuric acid and acetic acid in relation to lighting a lamp
.....
- 5) The reaction of acids with alkalis
.....
- 6) Heat a piece of magnesium and add the result to water, then place a red litmus paper in the solution.
.....
- 7) Melting sulphur oxides in rainwater
.....
- 8) Place a piece of sugar in a test tube containing concentrated sulphuric acid.
.....
- 9) Place a red and a blue sunflower paper in a tube containing hydrogen gas.
.....
- 10) Place a red and a blue sunflower paper in a tube containing chlorine gas.
.....
- 11) Add calcium hydroxide to acidic soil.
.....
- 12) You dip two litmus strip in a cup containing an acidic solution.
.....
- 13) You dip two litmus strip in a cup containing an alkaline solution.
.....
- 14) Accumulation of lactic acid in muscles.
.....
- 15) Combustion of metal with oxygen.
.....
- 16) Melting of sulfur and nitrogen oxides in water vapor in the atmosphere.
.....
- 17) Increasing in body weight relative to its potential energy.
.....
- 18) Decreasing in distance traveled during the same time.
.....
- 19) Strong impact on an object with zero displacement.
.....

Unit 2

- 20) Vehicles exceed the permitted speed limits.
.....
- 21) A moving object covers the same distance it travelled in half the time
(Regarding its speed).
.....
- 22) Exerting a suitable force on a stationary object (an object at rest).
.....
- 23) The force which affects an object increases in the direction of its
movement (Regarding the work done).
.....
- 24) The weight of an object is doubled while its height above the ground
remains constant (Regarding its potential energy).
.....
- 25) The vertical distance to which the object is lifted above the ground
decreases to half while its weight remains constant (Regarding its potential
energy).
.....
- 26) The speed of a moving object doubles while its mass remains constant, in
relation to its kinetic energy
.....
- 27) The mass doubles and the speed less than half, in relation to kinetic energy
.....
- 28) The speed of a moving object is doubled, while its mass remains constant
(in terms of kinetic energy).
.....
- 29) An object falling from a height (in terms of potential and kinetic energy).
.....
- 30) A pendulum passing through a position of rest (in terms of potential and
kinetic energy).
.....
- 31) Two cars (1 and 2) with the same mass move at two different speeds, in
relation to kinetic energy
.....
- 32) Lack of food sources in a balanced ecosystem

33) Food shortage for a group of hyenas

34) The absence of one living organism present in a balanced ecosystem.

35) An increasing in the number of primary consumers in the food chain.

36) Lack of food sources among members of biotic population.

37) A difference in the order of nucleotides in a single chromosome

38) The formation of genes for certain enzymes

39) Placing watermelons in square-shaped metal molds when they grow

40) Variation in the arrangement of nucleotides on DNA.

41) Fill a water bottle to the brim and place it in the refrigerator for several hours.

Unit 4

42) Water freezes in the cracks between rocks.

43) Water flows between rocks.

44) The temperature of the minerals that make up the rocks drops at night.

45) Plant roots grow inside the cracks between the rocks.

46) Adding drops of hydrochloric acid to a piece of limestone.

47) Bring a match close to the gas produced by adding the acid to the limestone.

48) Placing a cup of water in a sunny place for several hours.

49) Placing pieces of ice in a cup of water.

50) The water cycle suddenly stops.

51) When the temperature of the clouds is below freezing.

52) When small ice crystals gather during thunderstorms.

53) Limestone rocks being exposed to heat and pressure.

54) Magma rising to the Earth's surface.

55) Magma intruding between cracks and layers in the Earth.

5

Answer the following

Unit 1

1) Choose the odd word (or phrase) out, then mention the relation between the rest:

- Gold / Silver / Bromine / Mercury
- Phosphorus / Bromine / Mercury / Sulfur
- Graphite / Bromine / Phosphorus / Sulfur
- Iodine / Sulfur / Carbon /
- Bronze / Chlorine / Copper / Tin

2) What is the benefit of recycling metal waste?

3) Two elements (A, B) their melting points is (1538°C – 115.21°C)

A- What type are they? Explain your answer.

B - Which one is a good conductor of electricity?

C - Which one can be hammered and drawn?

Unit 2

- 4) Calculate the time taken by a car moving at a speed of 40 m/s to cover a distance of 200 m
- 5) Calculate the height of an object of mass 6 kg above the ground when its potential energy is 180 J , knowing that the gravitational field intensity is 10 N/kg
- 6) Calculate the speed of an object that covers distance of 50 km in 2 h .
- 7) A person pushes an object with a force of 40 N , causing it to move in a straight line for a distance of 10 m . Calculate the amount of work done.
- 8) Calculate the potential energy of an object with a mass of 15 kg at a height of 150 cm , given that the acceleration due to gravity is 10 m/s^2 .
- 9) An object moves at a speed of 20 km/h . Calculate the distance traveled after 3 h .
- 10) An object exerted a work of (50 J) to move a wheel a distance of (10 m) . Calculate the amount of force required to exert the work.
- 11) An object has a potential energy (240 J) at a height of (12 m) . Calculate the weight of the object.
- 12) What factors determine potential energy?
- 13) What is the relationship between work and both force and displacement?
- 14) What mathematical relationship is used to calculate velocity?
- 15) What mathematical relationship is used to calculate work?
- 16) What mathematical relationship is used to calculate potential energy given weight?
- 17) What mathematical relationship is used to calculate potential energy given mass?
- 18) What are the conditions for doing work?

19) Problems

1- Calculate the mass of an object whose kinetic energy is (0.5 kJ) and whose speed is (5 m/s).

.....

2- Calculate the speed of a ball with a mass of (600 g) and kinetic energy of (100 J).

.....

3- An object with a mass of (8 kg) moves at a speed of (4 m/s). Calculate the kinetic energy of the object if its mass doubles while its speed remains constant.

.....

4- An object with a mass of (10 kg) moves at a speed of (3 m/s). Calculate the kinetic energy if its speed doubles while its mass remains constant.

.....

5- Calculate the kinetic energy of a ball with a mass of (20 kg) moving at a speed of (4 m/s).

.....

6- Calculate the kinetic energy of an object with a weight of (20 N) moving at a speed of (6 m/s).

.....

7- Calculate the kinetic energy of an object with a mass of 500 g covering a distance of 20 m in 4 s.

.....

8- An object slides from a height of 2 m. If its mass is 2 kg, calculate the total mechanical energy at the starting point.

.....

9- A ball with a mass of 0.5 kg falls from a height of 15 m. Calculate its kinetic energy at the moment it reaches the ground if the mechanical energy is constant.

.....

10- An object with a mass of 2 kg falls from a height of 8 m. Calculate both the potential energy and kinetic energy at the following positions:
A. At the point of fall. B. At the midpoint of the distance.

.....

- 20) Calculate the kinetic energy of an object of mass 12 kg moving with a speed of 1 m/s
-
- 21) An object its mass is 600 g is thrown upwards vertically at a speed of 20 m/s Calculate : [Given that : 1000 g m 1 kg]
- (1) The kinetic energy of the atjeet at the moment of being thrown upwards
-
- (2) The mechanical energy of the object at the maximum height it reaches.
-
- 22) Calculate the kinetic energy of a plastic ball with a mass of 4 kg moving at a speed of 2 m/s.
-
- 23) Calculate the mechanical energy of an object with kinetic energy of 4 J and potential energy of 5 J.
-
- 24) When is?
- 1 - Kinetic energy = zero.
-
- 2 - Kinetic energy is numerically equal to twice the mass of the object.
-
- 25) Determine the importance or function of each of the following:
- 1- Converting potential energy into kinetic energy in dams?
-
- 2- The rubber band in a slingshot?
-
- 3- Distributing the weight of objects evenly across the leg muscles when lifting them off the ground.
-

26) What does it mean that: The kinetic energy of an object is 250J.

27) Create food chains and food webs from the following organisms:

Unit 3

1- Carrot - Shrimp - Grass - Seal - Wheat - Deer - Mouse - Rabbit - Bacteria and Fungi - Sparrow - Fox - Falcon - Snake - Fish - Bear - Algae – Lion

2- Carrot - Shrimp - Grass - Seal - Wheat - Deer - Mouse
- Rabbit - Sparrow - Fox - Falcon - Snake - Fish - Bear
- Algae - Lion.

28) Problem: Calculate the amount of transferred energy which reaches to third level if the energy at the first level is equal to 1000J.

Given:

Rule:

-The energy which reaches the second level =

-The energy which reaches the third level =

29) What is the hypothesis which the two scientists Beadle and Tatum affirmed ? What does it mean ?

30) What is the effect of killing hawks on the number of earthworms in a food chain consisting of grasses, hawks, earthworms and snakes ?

31) What is the type of the nutritional relationship between each of the following:

(1) The wolf and the rabbit.

(2) The fly and the Dionea plant.

(3) The polar bear and the seal.

32) Mention the type of food relationship in each of the following:

Unit 3

1) The remora fish that sticks to the shark's body and gets its food remains without affecting it on the shark.	(.....)
2) The falcon that hunts mice.	(.....)
3) The trees in the forest are densely packed together, blocking light from the short trees.	(.....)
4) Spiders hunt insects	(.....)
5) Algae live inside the coral tissues	(.....)
6) Lions and hyenas compete for gazelles or zebra.	(.....)
7) A genetic trait.	(.....)
8) An induced mutation.	(.....)
9) An acquired trait.	(.....)
10) A spontaneous mutation.	(.....)
11) A carnivore.	(.....)
12) A competition relationship.	(.....)
13) A commensalism relationship.	(.....)
14) A decomposer.	(.....)
15) An omnivore.	(.....)
16) A scavenger.	(.....)
17) A producers.	(.....)
18) The sun in the water cycle in nature	(.....)
19) Gravity in the water cycle in nature	(.....)
20) Wind in the water cycle in nature	(.....)
21) The water cycle in nature	(.....)

Unit 4

33) What processes lead to the transformation of:

Unit 4

(1) Limestone rocks into marble rocks ?

.....

(2) Quartzite rocks into sandstone rocks ?

.....

34) Explain the role of living organisms in the water cycle.

.....

35) Why is the boiling point **considered** a characteristic property of pure substances, not evaporation?

36) Classify the following according its type(genetic traits, acquired traits, or instinctive behaviors):

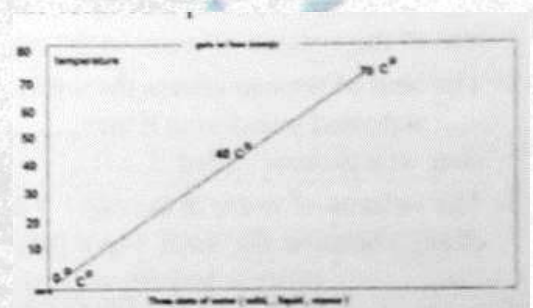
- | | |
|--|-------------------------------------|
| 1- Reading and writing. | 2- The length of a giraffe's neck. |
| 3- A squirrel breaking a hazelnut shell. | 4- Learning to swim. |
| 5- A spider weaving its web. | 6- The short legs of an arctic fox. |
| 7- Learning the Indian language. | 8- Birds laying on eggs. |
| 9- A horse jumping over obstacles. | 10- Facial freckles. |
| 11- Breast feeding. | 12- Blood type. |
| 13- A dolphin playing ball. | |
| 14- A bat sleeping upside down. | 15- Hair color. |

37) Arrange the following sentences in the correct order of the water cycle in nature by placing the numbers (1-5) in front of the appropriate sentence:

- Condensation of water droplets in clouds
- Heating of the ocean surface by heat of sun and evaporation of water.
- Air currents in contact with the earth's surface carry water vapor upward
- Water precipitates on high ground on the earth
- Water droplets fall to the earth in the form of liquid water or snow.

38) Look at the graph in front of you:

- Explain the process of water transformation when it loses or gains thermal energy.



39)	(A)	(B)
.....	Water movement in different pathways in different ecosystem.	1 Run off
.....	Water in its liquid state absorbs thermal energy and turns into water vapor.	2 Depositions
.....	Water vapor loses thermal energy and turns into liquid water.	3 condensation
.....	Water falls to the surface of the earth due to gravity.	4 evaporation
.....	Water flows down highlands and descends into seas and rivers.	5 Water cycle

6

choose the correct answer

Unit 1

1) All the following are properties of sodium element, except that it

A) is a metal.

B) has metallic luster.

C) is a bad electrical conductor.

D) is formable.

2) Which of the following is the correct arrangement of the hardness of sodium $_{11}\text{Na}$, magnesium $_{12}\text{Mg}$ and aluminum $_{13}\text{Al}$?

A) $\text{Na} > \text{Mg} > \text{Al}$ B) $\text{Al} > \text{Mg} > \text{Na}$ C) $\text{Mg} > \text{Na} > \text{Al}$ D) $\text{Al} > \text{Na} > \text{Mg}$

3) Element (X) its boiling point is 2807°C and its melting point is 1064°C
Which of the following is a property of element (X)?

A) Bad electrical conductor.

B) Brittle.

C) Formable.

D) Opaque.

4) Which of the following questions helps in the classification of some elements to metals and nonmetals ?

A) Is it solid ?

B) Is it liquid ?

C) Is it coloured ?

D) Is it brittle?

5) What is the common property of both sodium and copper?

A) Colour.

B) Density.

C) Melting point.

D) Physical state.

- 6) If the anion which composes the acid HClO is called hypochlorite, then the acid is called
- A) hypochlorous acid. B) hypochloric acid.
C) perchloric acid. D) chlorous acid.
-
- 7) What is the ion whose percentage in the solution increases when an acidic oxide dissolves in water?
- A) H^+ B) OH^- C) Cl^- D) H^+
-
- 8) Element (X) forms the oxide XO which reacts with acids. Which of the following represents (X) and XO ?
- A) (X): Metal, XO : Acidic oxide. B) (X): Nonmetal, XO : Acidic oxide.
C) (X): Metal, XO : Basic oxide. D) (X): Nonmetal, XO : Basic oxide.
-
- 9) On dissolving calcium oxide in water and placing two litmus strips in the solution , the colour of one of them changes into
- A) red. B) purple. C) blue. D) yellow.
-
- 10) Which of the following are properties of solid sodium hydroxide ?
- A) It dissolves in water, and reacts with HCl acid.
B) It dissolves in water, and does not react with HCl acid.
C) It does not dissolve in water and does not react with HCl acid.
D) It does not dissolve in water and reacts with HCl acid.
-
- 11) A red litmus strip is placed in solution (1), so no change in colour occurs, when it is placed in solution (2), it becomes blue.
- Which of the following is correct?
- A) Solution (1): Neutral , Solution (2): Acidic.
B) Solution (1): Acidic , Solution (2) Neutral.
C) Solution (1): Acidic , Solution (2) Alkaline.
D) Solution (1): Alkaline , Solution (2): Acidic.
-
- 12) The colour of the universal indicator is the same in both
- A) tomato juice and hydrochloric acid.
B) distilled water and sodium chloride solution.
C) tomato juice and sodium hydroxide solution.
D) distilled water and hydrochloric acid.
-

13) All the following from ions that form salts, except

- A) OH^- B) Cl^- C) NH_4^+ D) NO_3^-
-

14) All the following are properties of solid sodium carbonate salt, except that

- A) it dissolves in water. B) pH of its solution is higher than 7
C) its colour is white. D) it conducts electricity.
-

15) pH value of a solution is changed from 8 to 5, that means it was

- A) acidic and becomes alkaline. B) acidic and becomes neutral.
C) alkaline and becomes neutral. D) alkaline and becomes acidic.
-

16) Which of the following cases involves doing work?

- A) Lifting a bag from the floor, pushing a shopping cart.
B) Carrying a backpack while walking, pushing a shopping cart.
C) Lifting a bag from the floor, pushing a tree.
D) Carrying a backpack while walking, pushing a tree.
-

17) The potential energy of an object depends on

- A) its weight and speed.
B) its weight and mass.
C) its weight and height above the ground.
D) its speed and height above the ground.
-

18) Which of the following nutritional relationships causes harm the organisms ?

Unit 3

- (a) Predation and competition. (b) Mutualism and commensalism
(c) Mutualism and predation. (d) Predation and commensalism.
-

19) In a food chain that includes insect, fish, plant and swan.

Which of these living organisms is considered as a predator and a prey at the same time ?

- (a) The insect. (b) The fish. (c) The plant. (d) The swan.
-

20) Millions of nucleotides come together directly, forming

- (a) chromosomes. (b) chromatids. (c) genes. (d) histones
-

21) Which of the following represents harmful natural mutations and which represents beneficial spontaneous mutations, respectively?

- (a) Muscular dystrophy in children, seediness grapes.
 - (b) Muscular dystrophy in children, lactose tolerance.
 - (c) Six fingered hand, lactose tolerance.
 - (d) Six fingered hand, cubie-shaped oranges.
-

22) What is the composition of the mixture which is used to separate strawberry chromosomes?

- (a) Salt, dishwashing liquid and water only.
 - (b) Salt, ethyl alcohol and water only.
 - (c) Dishwashing liquid and ethyl alcohol only.
 - (d) Salt, dishwashing liquid and ethyl alcohol
-

23) Clouds and rain are formed through the processes of

Unit 4

- (a) condensation and precipitation.
 - (b) condensation and evaporation.
 - (c) evaporation and surface runoff.
 - (d) precipitation and surface runoff.
-

24) A person wearing wet clothes feels cold, despite the warm weather, because

- (a) water loses heat when it evaporates.
 - (b) water gains heat when it evaporates.
 - (c) water vapour loses heat when it condenses.
 - (d) water vapour gains heat when it condenses.
-

25) What are the two processes that occur at any temperature ?

- (a) Melting and boiling.
 - (b) Evaporation and condensation.
 - (c) Melting and evaporation.
 - (d) Evaporation and boiling.
-

26) The three types of rocks are classified according to ...

- (a) the way they are formed.
- (b) the depth at which they are found.
- (c) their chemical properties.
- (d) their relative age.

27) Metamorphic rocks are formed through the processes of ..

- (a) melting and crystallization.
- (b) transportation and sedimentation.
- (c) heat and pressure.
- (d) erosion and weathering

28) The rock cycle is a model that illustrates

- (a) the unchanging of rocks
- (b) how magma is formed
- (c) how sediments are formed.
- (d) transformations of rocks.

29) Which of the following illustrates the correct sequence for the formation of sandstone rocks ?

- (a) Weathering → Transportation → Sedimentation.
- (b) Erosion → Weathering → Sedimentation
- (c) Melting → Cooling → Crystallization
- (d) Pressure → Heat → Crystallization.

7

Define the following (what is meant by)

Unit 1

1)	Metal	.....
2)	Nonmetal	.....
3)	Metallic bond	.....
4)	Alloy	.....
5)	Recycling	.....

6)	Atomic group	.....
7)	Acid	.....
8)	Alkali	.....
9)	Basic oxides	.....
10)	Acidic oxides	.....
11)	Acid rains	.....
12)	Indicators	.....
13)	Universal indicator	.....
14)	pH value	.....
15)	Salts	.....
16)	Path of movement	.....
17)	Distance (d)	.....
18)	Displacement (s)	.....
19)	Speed (v)	.....
20)	Work (W)	.....
21)	Controlling the variables	.....
22)	Independent variable (Cause)	.....
23)	Dependent variable (Effect)	.....
24)	Controlled variables	.....
25)	Energy (E)	.....
26)	Potential energy (PE)	.....
27)	The distance covered by an object equals 20 m	.....
28)	The displacement of an object equals 10 m	.....

29)	The speed of an object is 100 m/s	
30)	A moving car covers a distance of 20 km in 2 h	
31)	The potential energy of an object is 20 J	
32)	An object with potential energy of 80 J is at a height of 10 m	
33)	Mechanical energy	
34)	Kinetic energy	
35)	The ecosystem	
36)	Nutritional Relationships	
37)	Commensalism	
38)	Mutualism	
39)	Predation	
40)	Food chain	
41)	The individual	
42)	Bio community	
43)	Competition	
44)	Ecosystem	
45)	Biological control	
46)	Energy pyramid	
47)	Genetics	
48)	Inherited traits	
49)	Instinctive behaviors	
50)	Acquired traits	

Unit 3

51)	Chromosomes	.....
52)	Mutation	.....
53)	Spontaneous mutation	.....
54)	Induced mutation	.....
55)	The centromere	.....
56)	Reproduction	.....
57)	Evaporation	.....
Unit 4		
58)	Condensation	.....
59)	Infiltration	.....
60)	Run off	.....
61)	Precipitation	.....
62)	Transpiration	.....
63)	Boiling	.....
64)	Water cycle	.....
65)	Transpiration	.....
66)	Rocks	.....
67)	Weathering	.....
68)	Mechanical weathering	.....
69)	Chemical weathering	.....
70)	Erosion	.....
71)	Lithification	.....

8

compare between eqch of the following

Unit 1

- 1) Phosphorus - Iron
- 2) Sodium and graphite
- 3) Sulphur and copper
- 4) Silver and phosphorus
- 5) Metals and nonmetals
- 6) Acid and alkali

- 7) HCl and NaOH
- 8) strong acids and weak acids
- 9) Strong alkalis and weak alkalis
- 10) Basic oxides and Acidic oxides
- 11) Ammonium chloride, Sodium chloride and Sodium carbonate solution
- 12) potential energy and kinetic energy.
- 13) compare between producer ,consumer and decomposers in term of definition ,examples Unit 3
- 14) compare between herbivores ,carnivores , omnivores and scavengers in terms of definition ,examples
- 15) Hereditary traits and acquired traits in terms of Definition – Examples
- 16) Acquired traits and instinctive behaviours in terms of Definition – Examples
- 17) Spontaneous mutation and induced mutation in terms of: Definition – Examples
- 18) Scavengers and omnivorous "in terms of type of food, example"
- 19) Predation and mutualism
- 20) Sedimentary, metamorphic, and igneous rocks in terms of:
Examples - Method of formation.

- 21) Plutonic igneous rocks and extrusive igneous rocks in terms of:
Method of formation - Examples - Crystal size. Unit 4
- 22) Infiltration and surface runoff.
- 23) Evaporation and transpiration.
- 24) Fill in the blanks in the following form, explaining the similarities and differences between the three types of rocks:

9

correct the following statement

Unit 3

- 1) Inherited traits are traits passed from offspring to parents
.....
- 2) Brown eye color is an acquired trait
.....
- 3) The presence of a solid body structure covering the frog is an inherited trait
.....

- 4) Instinctive behaviors are passed from parents to offspring without learning
.....
- 5) Acquired traits are not inherited and are acquired by humans from the environment
.....
- 6) Breastfeeding is an acquired trait
.....
- 7) Genetic material is found in the cytoplasm of eukaryotes
.....
- 8) Chromosomes are thread-like bodies found inside the nucleus in the bean Plant
.....
- 9) The chromosome is chemically composed of DNA and protein
.....
- 10) The nucleic acid is made up of small parts known as nucleotides
.....
- 11) Spontaneous mutation occurs without human intervention
.....
- 12) Production of featherless chickens is considered induced mutation
.....
- 13) Light skin color people living in cold regions due to beneficial mutations
.....
- 14) Production of cube-shaped watermelons from induced mutations
.....
- 15) People who suffer from lactose intolerance experience cramps and nausea when they eat meat
.....
- 16) Beneficial mutations cause the appearance of desirable traits
.....

- 17) The chromosome consists of two threads, each of them called a chromatid.
- 18) The number of chromosomes in human is 46 chromosomes and in corn plant is 32 chromosomes
- 19) Rocks are solid objects composed of only one mineral.
- 20) Rocks are classified into three types: sedimentary, igneous, and limestone.
- 21) Chemical changes alone cause geological processes in rocks.
- 22) Weathering is the process of breaking down and fragmenting rocks.
- 23) Mechanical weathering is the process of breaking down and fragmenting rocks without changing their chemical composition.
- 24) Water freezing in rock cracks causes them to freeze.
- 25) Chemical weathering is the process of breaking down and fragmenting rocks with a change in their properties.
- 26) Yellowstone National Park is a good example of chemical weathering.
- 27) Calcium carbonate powder is used in making casts for broken bones.

Unit 4

10 Write the chemical formula for the following compounds

Unit 1

	Name	Formula
1	Hydrochloric acid	.....
2	Hydrobromic acid	.....
3	Sulphuric acid	.....
4	Phosphoric acid	.....

5	Nitric acid	.....
6	Potassium hydroxide	.....
7	An atomic group consisting of three elements	.....
8	Nitrous acid	.....
9	Sodium chloride	.....
10	Calcium hydroxide	.....
11	Aluminum sulfate	.....
12	Potassium nitrate	.....
13	Sodium carbonate	.....
14	Magnesium oxide	.....
15	Calcium phosphate	.....
16	Iron (III) chloride	.....
17	Hydrogen sulfide	.....
18	Ammonium hydroxide	.....
19	Sulfuric acid	.....
20	Sulfur dioxide	.....
21	Nitrogen monoxide	.....
22	Silver nitrate	.....
23	Sodium sulfide	.....
24	Aluminum oxide	.....
25	Sodium hydroxide	.....

11 What is the use(function) of each of the following

Unit 1

Subject		Function / Use
1	Stomach acid	.....
2	Litmus paper	.....
3	Graphite	.....
4	Bronze alloy	.....
5	Recycling of elements	.....
6	Lactic acid	.....
7	Magnesium milk	.....
8	Sulfur and nitrogen oxides	.....
9	Acidic oxides	.....
10	Basic oxides	.....
11	Adding tin to copper	.....

12	Adding calcium hydroxide to soil	.....
13	Universal guide	.....
14	pH meter	.....
15	Scientist Soren Sorensen	.....
16	Scientist Arrhenius	.....

12 various questions

Unit 1

1) Identify the damage caused by acid rain :

2) The value of the basic solution increases as the pH number approaches 14



a- Which substances are less acidic ?

and which are more acidic ?

b- Which substances are less basic ?

Which are more basic ?

c- The colour of hydrangea flowers varies, where:

- They turn in alkaline soil, and blue in acidic soil.



3) Physical properties of salts :

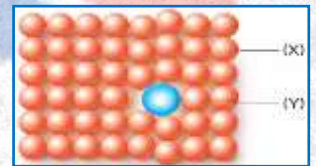
Salts differs from each other in :

Color	White	.....
	Blue	.....
	Green	.....
Solubility in water	Soluble salt	.....
	insoluble	.....

pH value	Acidity	.....
	Alkalinity	.....
	Neutral	.....
Electricity		.....
		

The salinity of dead sea is higher than that of the red sea, and therefore its density (no object can sink in it)

4) The opposite figure illustrates the composition of the bronze alloy:



(1) What are the elements (X) and (Y)?

.....

(2) Why are alloys preferred to be used more than the pure metals?

.....

5) Can the type of potassium hydroxide solution be identified by using the blue litmus strip? Explain.

.....

6) Element (X) oxide has the following properties:

- ❖ It can react with acids.
- ❖ It does not react with alkalis.

Is element (X) sulphur or copper? Explain.

.....

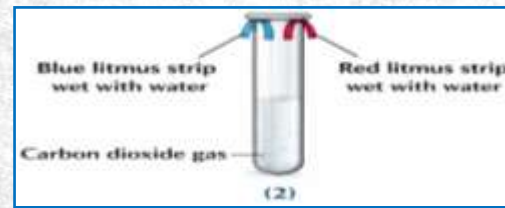
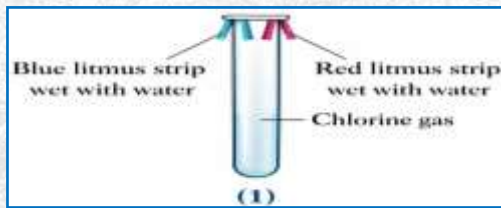
7) The opposite figures show the same statue left in open air for nearly 100 years :

Why did the details of the statue disappear according to what you have studied?



.....

8) What happens to the colours of the litmus strips in the following cases?

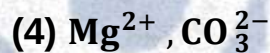
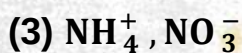
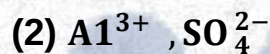
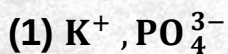


9) Acidity of the soil varies from one place to another:

(1) How can acidic soil be treated?

(2) What is the colour of Hydrangea flowers which grow in acidic soil?

10) Write the molecular formulas of the salts composed from the following cations and anions:



Unit 2

11) look at the following figure then answer :

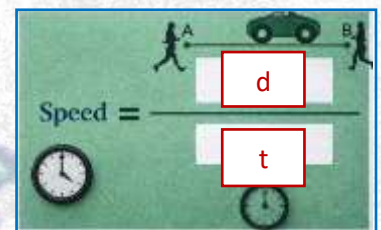
- The path taken by the car represents
- The path taken by the person represents
- The measuring unit for the physical quantity represented by the path of the car is



12) Complete the figure :

- Speed is defined as

Speed is measured in units of or.....



- Calculate the speed of an object that covers distance of 10m in a time of 5s.

- When is the distance covered equal to the displacement ?

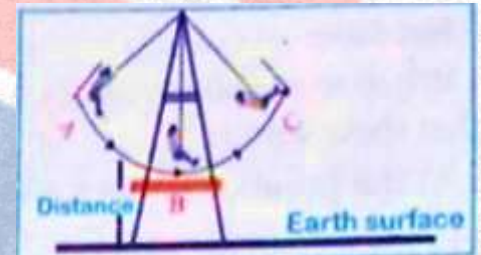
- When is the speed equal to the distance covered ?

13) From the forms of the potential energy:

- 1- potential energy like
- 2- potential energy like
- 3- potential energy like

14) Look at the figure in front of you:

- 1- The reference point (rest position) of the swing
- 2- At what position is the potential energy is greatest?



Explain

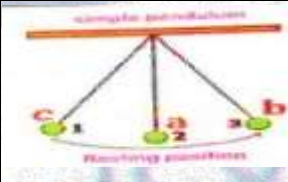
- 3- At what position the potential energy equal to zero ?

- 4- At what position the kinetic energy greatest ?
Explain

- 5- At what position the kinetic energy equal to zero?
.....

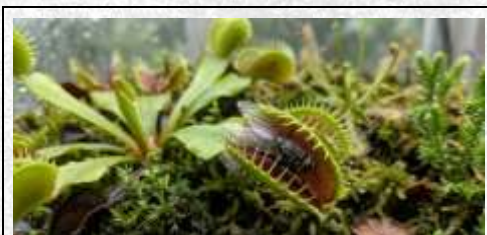
- 6- The sum of the potential and kinetic energies =
.....

15) Energy transformations in a simple pendulum

Body energy	At the point (c,b) maximum height		At the resting position
P.E			
K.E			

16) Notice the following pictures then determine the predator and prey

Unit 3

		
..... is a prey is a predator	 is a prey is a predator	 is a prey is a predator

17) Notice the following picture then complete:

- The picture represents theon
- In this relationship both individuals are



18) Notice the following picture then complete:

- The picture represents the relationship
Between and
- obtain nitrogenous materials from which fix nitrogen from the air to build, while obtain their food from plant as a result of the process of



19) Notice the following picture then complete:

- The image represents the relationship between and
- The benefits by feeding on leftover food that get trapped between the crocodile's teeth, While the neither benefits nor is harmed.



20) Notice the following figure then complete:

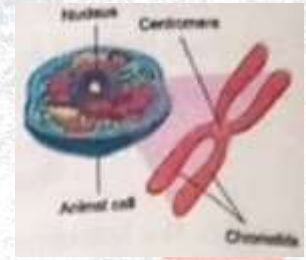
- The image represents food chain.
- The represents a producer.
- The represents a primary consumer.
- The represents a secondary consumer.
- The represents a tertiary consumer.
- The energy flow in this food chain is expressed as follows:



21) Structure of chromosomes

Notice the opposite figure then complete:

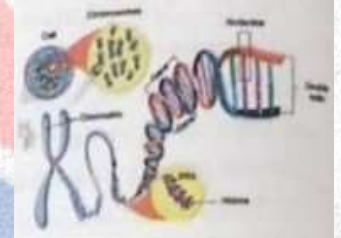
- Each chromosome consist of two threads, each called, and connected at a central point known as



22) The chemical structure of DNA

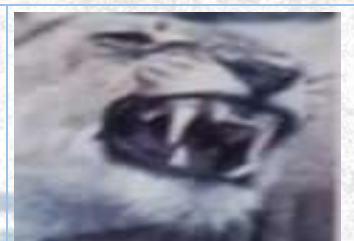
Notice the opposite figure then complete:

- The chromosomes composed of, abbreviated as, wrapped around a type of protein known as
- The nucleic acid DNA is made up of small segments called, they are responsible for appearance of
- Each gene consists of a sequence of smaller building units known as which exist in the form of two strands twisted around each other, forming what is known as



23) Which of these organisms is an omnivores, scavengers, herbivores, or camisoles?

24) Compare between the lion and the horse in terms of: type of food, shape of teeth.



.....

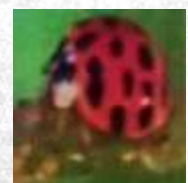
.....

.....

.....

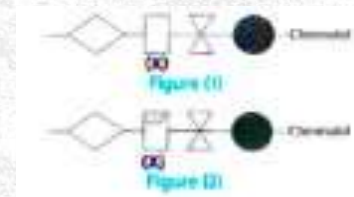
25) Answer the following questions:

- What is the name of this organism?.....
- What organisms does it feed on?.....
- Mention its benefits for the environment?



.....

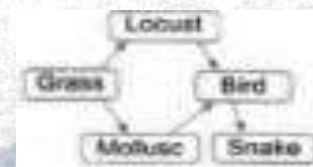
26) The illustrative figure (1) represents a part of a chromosome in the body of a woman and the illustrative figure (2) represents the same chromosome in another cell in the body of the same woman:



- (1) What is the term used for part (X) of the chromatid ?
- (2) What is the term used to describe the change occurring in part (X) in figure (2) ?

27) In the opposite food web:

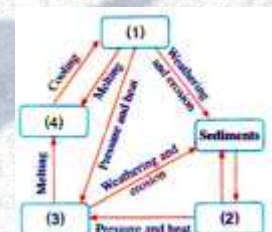
- (1) How many food chains do make up this web ?
- (2) Complete: To reduce the number of molluscs, it is necessary to increase the number of and reduce the number of



28) The opposite model instates the rock cycle:

Unit 4

Replace the numbers from (1): (4] with the appropriate terms from the following



- (1) Sedimentary rocks
- (2) Igneous rocks
- (3) Metamorphic rocks
- (4) Magma.



①

Write the scientific term:

Unit 1

1)	Elements that have metallic luster and are good conductors of heat and electricity.	Metals
2)	Brittle elements in which the last energy level contains more than 4 electrons.	Nonmetals.
3)	The attraction force between positive metal ions and the negative valence electron cloud which surrounds them.	Metallic bond
4)	A mixture composed of the melts of two metals or more.	Alloy
5)	An ion composed of more than one atom of more than one element.	Atomic group or polyatomic ion.
6)	A scientist who clarified that alkalis are substances that dissolve in water and give (produce) hydroxide ions.	The scientist Arrhenius
7)	A substance whose dissolution in water leads to an increase in the percentage of H^+ cations in the solution.	Acid
8)	A substance whose dissolution in water leads to an increase in the percentage of OH^- anions in the solution.	Alkali
9)	Rains which result from the dissolution of acidic oxides in the atmospheric water vapour.	Acid rains.
10)	Chemical substances whose colour differs in acidic medium from that in alkaline medium.	Chemical indicators
11)	An indicator that can differentiate between the different acids or the different alkalis according to their strength.	Universal indicator
12)	A Danish scientist who developed pH scale to differentiate between acidic, basic and neutral solutions.	The scientist Soren Sorensen.
13)	A scale that ranges between the values 0 to 14, and is used to determine the acidity and the basicity of solutions.	pH scale.
14)	Compounds, mostly ionic, formed from the combination of an alkali cation with an acid anion.	Salts
15)	The set of points through which the object passes during its motion	Path of movement.
16)	The total length of any path taken by the object during its moving from the starting point to the end point.	Distance
17)	The shortest straight path connecting between the starting point and the end point in a constant direction.	Displacement
18)	The distance covered per unit time.	Speed

Unit 2

19)	The amount of energy required to move an object through a certain displacement in the same direction of the force acting on it.	Work
20)	The quotient of the work done divided over the displacement, which is estimated in newtons.	Force
21)	One of the skills in scientific research and designing scientific comparative experiments.	Controlling variables.
22)	The variable which is changed during the experiments.	Independent variable.
23)	The variable to be tested which is being changed in response to changing the independent variable.	Dependent variable.
24)	The ability to do work.	Energy
25)	The energy stored in the object as a result of the work done on it.	Potential energy.
26)	The product of multiplying the mass of the object by the Earth's gravitational field intensity	Weight.
27)	The energy acquired by an object as a result of its motion.	Kinetic energy.
28)	The sum of the potential and the kinetic energies of any moving object.	Mechanical energy.
29)	Energy used in operating turbines to generate electricity from the High Dam.	The kinetic energy of water.
30)	A heavy tool used in demolishing old buildings as a result of the conversion of potential energy into kinetic energy.	Demolition (wrecking) ball.
31)	Any place that includes living organisms and non-living (abiotic) components and includes several levels of organization.	The ecosystem.
32)	The fundamental unit in the classification of the living organism.	Species.
33)	The various biotic populations of different species that inhabit the same environment.	Biological community.
34)	A group of individuals of the same species living in a particular place at the same time.	Biotic population.
35)	A nutritional relationship between two organisms, one of them benefits and the other is harmed.	Predation.
36)	A nutritional relationship between two individuals of the same species for a food source that exists in limited quantities.	Competition.

Unit 3

37)	A nutritional relationship between two organisms where both of them benefit from each other without causing harm to either of them.	Mutualism.
38)	A nutritional relationship between two organisms known as the commensal and the host.	Commensalism.
39)	Autotrophic organisms that can make their own food through the photosynthesis is process.	Producers.
40)	Animals that depend on the producers to obtain their food.	Herbivorous organisms (Herbivores)
41)	Consumers that feed on plants and animals.	Omnivores.
42)	Consumers that feed on the remain of dead organisms.	Scavengers.
43)	Organisms that obtain energy from the breaking down of the organic substances found in dead bodies.	Decomposers.
44)	The path of energy flow in the form of food as it moves from one living organism to another within the ecosystem.	Food chain.
45)	A method in which food systems utilize living organ agricultural pests instead of using pesticides, living organisms to eliminate	Biological control.
46)	The interconnection and overlapping of multiple food chains together.	Food web.
47)	A pyramid represents the flow of energy and its amounts between different trophic levels in any food chain.	Energy pyramid.
48)	Traits that are inherited from one generation to the next.	Genetic traits.
49)	Traits that are not inherited from parents to offspring but are acquired from the surrounding environment through learning or training.	Acquired traits.
50)	Behaviors and skills that are transmitted from parents to offspring without learning.	Instinctive behaviors (instinct).
51)	A vital process aims to produce new individuals resembling their parents.	Reproduction.
52)	Thread-like bodies representing the genetic material of the eukaryotic organism.	Chromosomes.
53)	The central point at which the two chromatids of the chromosome are connected.	Centromere.
54)	Segments of the nucleic acid DNA found in chromosomes, responsible for the appearance of the hereditary traits in the living organism.	Genes.
55)	The smallest building unit of the nucleic acid DNA	Nucleotide.

56)	The science that studies the transmission of genetic traits from parents to offspring.	Genetics.
57)	Each gene produces a specific enzyme responsible for occurrence of a chemical reaction that leads to the formation of a protein that expresses a specific hereditary trait.	One gene - one enzyme hypothesis.
58)	The emergence of a new hereditary trait that did not previously exist, as a result of a change in the nature of the gene responsible for it.	Mutation.
59)	Mutations that occur naturally without human intervention.	Spontaneous mutations.
60)	Mutations that occur through human intervention.	Induced mutations.
61)	Mutations that cause the appearance of new undesirable traits, some of them may lead to death.	Harmful mutations.
62)	Mutations that cause the appearance of new desirable traits, whether occurring naturally or through human intervention.	Beneficial mutations.
63)	The conversion of water from the liquid state to the gaseous state upon gaining heat.	Evaporation.
64)	The conversion of water from the gaseous state to the liquid state upon losing heat.	Condensation.
65)	The conversion of water from the liquid state to the solid state upon losing heat.	Freezing
66)	A natural process involving the movement of water between the atmospheric air and the earth in a closed multi-path cycle.	Water cycle.
67)	The process of water loss from plants in form of water vapour.	Transpiration.
68)	The process of falling of water from clouds to the Earth's surface in form of rain, snow or hail due to the effect of the Earth's gravity.	Precipitation.
69)	The process of rainwater flowing across the Earth's surface and into rivers, seas and lakes due to the effect of the Earth's gravity.	Surface runoff.
70)	The process of removing dissolved salts from seawater.	Desalination of seawater.
71)	Solid materials composed of one or several minerals.	Rocks.
72)	The process of breaking down and fragmenting rocks, that may take millions of years.	Weathering.

Unit 4

73)	The process of breaking down and fragmenting rocks without any change in their chemical structure.	Mechanical weathering.
74)	The process of breaking down and fragmenting rocks with a change in their chemical structure.	Chemical weathering.
75)	Chemical weathering that leads to the formation of spheres of rocks.	Spherical weathering.
76)	The processes of transportation and sedimentation of the rock fragments which resulting from weathering away from the areas where they were originally found.	Erosion.
77)	Rock fragments transported away from the area in which weathering occurred.	Sediments.
78)	Cohesive rocks formed from the lithification of sediments.	Sedimentary rocks.
79)	The rocks formed through the exposure of rocks located beneath the Earth's surface to extreme pressure and heat without reaching their melting point.	Metamorphic rocks.
80)	Molten rocks in the Earth's interior.	Magma.
81)	Magma when it reaches the Earth's surface.	Lava.
82)	Rocks formed from the solidification of lava or magma.	Igneous rocks.
83)	Rocks formed from the slow cooling of magma in the cracks of the Earth's crust.	Plutonic igneous rocks.
84)	Rocks formed from the rapid cooling of lava on the surface of the Earth's crust.	Surface igneous rocks.
85)	The transformation of rocks from one type to another through several processes.	Rock cycle.
86)	The fuel formed in the Earth's interior.	Fossil fuels.

2

complete the following sentence

Unit 2

1)	All metals are solid substances except <u>Mercury</u> is a liquid
2)	All non-metals are poor conductors of electricity except <u>Graphite (Carbon)</u> which is a good conductor of electricity.
3)	The atoms of solid metals are arranged in a pattern known as <u>Crystal Lattice</u> .
4)	The metallic bond is occurs as a result of the attraction force between <u>ions</u> positive metal and the surrounding negative <u>electrons</u> cloud.
5)	Bronze alloy is composed of 5% <u>Tin</u> and 95% <u>Copper</u> . And characterized by being more <u>harder</u> than copper and its <u>resistant</u> for rusting.
6)	Lactic acid supplies muscles with <u>Energy</u> ,When oxygen is deficient and accumulates in the muscles, it causes <u>Muscles cramps</u>

7)	The scientist Arrhenius explained that acids are substances that dissolve in water and give Hydrogen positive ions, while alkalis give Hydroxide negative ion when dissolved in water.
8)	Lemon and ketchup are considered acids substances, while toothpaste and baking soda are alkalis substances.
9)	Nitric acid is considered a strong acid, while nitrous acid and sulphurous acid are weak acids.
10)	Metals burn in an oxygen atmosphere and form basic oxides most of them are known as metallic oxides while non-metals burn in an oxygen atmosphere and form acidic oxides most of them are known as non-metallic oxides
11)	The dissolution of sulphur trioxide in water produces sulphuric acid (H_2SO_4)
12)	Melting magnesium oxide (MgO) in water produces magnesium hydroxide $\text{Mg}(\text{OH})_2$
13)	The combustion of fossil fuels produces oxides sulfur and nitrogen
14)	Indicators chemicals that change colour in an acidic medium compared to a basic medium, such as litmus paper
15)	We reduce soil acidity by adding substances such as calcium hydroxide $\text{Ca}(\text{OH})_2$
16)	The hydrogen number is accurately measured using pH meter
17)	Acidic gases SO_2 and CO_2 while basic gases NH_3
18)	Neutral gases on litmus paper are oxygen (O_2) and nitrogen (N_2)
19)	Produced by the reaction of acids with alkali salt and water
20)	Copper sulphate salt is blue in colour, while zinc sulphate salt is white in colour.
21)	The measuring unit of distance and displacement meter (m), cm, km
22)	The measuring unit of speed (m/s) and (km/h)
23)	The measuring unit of work joule (J) and newton.meter (N.m) while the newton is the measuring unit of force
24)	Work = force $\times$ displacement
25)	Factors affecting potential energy are weight (w) and height (h)
26)	The measuring unit of weight newton (N)
27)	5 km 5000 m , 3kJ = 3000 J
28)	Energy is measured in units of joule(J) and work is measured in units of joule(J)
29)	Mass is measured in units of kilogram (kg) and weight is measured in units of newton (N)
30)	The work done is directly proportional to force and displacement .
31)	Factors affecting the kinetic energy of a body Mass and velocity

Unit 2

32)	The unit of measurement for kinetic energy is joule and is equal to Kg x M/sec
33)	The kinetic energy of a body = $\frac{1}{2}M \times V^2$
34)	Kinetic energy is directly proportional to the mass and velocity
35)	The greater the mass of a body, decrease the speed of the body when the kinetic energy is constant.
36)	If the speed of an object decreases to half with constant mass, its kinetic energy decreases to one quarter (1/4) .
37)	When an object falls downwards, potential energy decreases and kinetic energy increases .
38)	The mass of an object is measured in units of kilogram (kg) , while its speed is measured in units of meter/second (m/s) .
39)	When the speed of a body increases three times, its kinetic energy increases 9 times its original value.
40)	The Predation is a nutritional relationship between two individuals, one of them called predator and the other called prey.
41)	The Predator is the individual that benefits from the predation relationship.
42)	The Prey is the individual that is eaten or loses its life in the predation relationship.
43)	The Competition is a nutritional relationship between two individuals of the same species for a food resource that exists in limited quantities, which negatively impacts their growth or survival.
44)	The Mutualism is a nutritional relationship between two individuals, both of them benefit from each other without causing harm to either of them.
45)	The commensalism is a nutritional relationship between two individuals, one of them benefits and the other neither benefits nor is harmed .
46)	The ecosystem consists of living organisms and non-living components .
47)	Non-living components such as water, air, and soil .
48)	The ecosystem consists of several levels: the individual, and community .
49)	Species is considered the basic unit in the classification of living organisms.
50)	Each stage in which energy is transferred in the food chain is called a trophic level .
51)	The rabbit and the horse are considered herbivores because they have incisors for cutting plants.
52)	Carnivorous animals such as lions and tigers are characterized by having sharp canines to tear their preys.
53)	Omnivorous animals such as bears and humans feed on both meat and plants.

Unit 3

54)	Hyenas and eagles are considered scavengers , as they feed on the remains of dead organisms.
55)	Each gene consists of smaller units called nucleotides .
56)	Nucleotides exist in the form of two strands twisted around each other, and called double helix .
57)	Each chromosome carries thousands or millions of Genes which vary in number from one chromosome to another in the cells of the same individual.
58)	The chromosome consists of Two chromatids which are connected at centromere .
59)	The chromosome is chemically composed of DNA and protein known as Histone .
60)	The nucleic acid is made up of small segments Called Nucleotides .
61)	The mixture used in separating strawberry chromosomes consists of Salt and Dishes Wishes soup with Alcohol .
62)	Gregor Mendel is considered the founder of genetics, and he conducted his experiments on the Pea plant.
63)	The scientists Beadle and Tatum affirmed hypothesis for expressing genetic traits and called it One gene—one enzyme theory .
64)	Genes produce Enzymes which is responsible for a chemical reaction that leads to the formation of proteins , showing the genetic trait.
65)	Spinal curvature is a result of Spontaneous harmful mutations.
66)	The production of seedless lemons is a result of Induced mutations.
67)	The main source of energy on Earth's surface is is the Sun .
68)	The food chain begins with a producer organism and ends with a decomposer organism.
69)	Fungi are considered decomposers , organisms, while sheep and rabbits are herbivores.
70)	Both living organisms are not harmed in a Mutualism relationship.
71)	The point where the two chromatids of the chromosomes are connected is called centromere .
72)	The two scientists who, affirmed the one gene-one enzyme hypothesis through their experiments, are Beadle and Tatum .
73)	Genetic material is found in chromosomes inside the cytoplasm prokaryotic organisms.
74)	The production of seedless fruits is considered a mutation caused by human interference is called induced mutation.
75)	A gene produces enzyme is responsible for a specific chemical reaction.
76)	The number of chromosomes in human skin cells is contain 46 chromosome.
77)	The albino mutation is spontaneous mutation.

78)	Behaviors and skills that are passed from parents to offspring without learning are instinctive and inherited .
79)	The short legs of Arctic fox is a Genetic trait, while the taming lions is a Acquired trait
80)	DNA is composed of small segments called Genes , each of them consists of a sequence of Nucleotides .
81)	The genetic material is found in the cytoplasm of prokaryotic organisms and in the nucleus of eukaryotic organisms
82)	Examples of hereditary traits in humans are hair colour and eye colour .
83)	Examples of acquired traits in humans are learning to swim and building muscles .
84)	A hen sitting on eggs is an example of a(n) instinctive behavior, while a dolphin playing with a ball is a(n) acquired trait
85)	Chromosomes are found in a thread-like shape inside the nucleus
86)	Genetic traits are passed from parents to offspring through genes
87)	The scientists Beadle and Tatum concluded that each gene is responsible for producing Enzyme which is responsible for the formation of Protein .
88)	The science that studies the transmission of genetic traits from parents to offspring is called _Genetics_ .
89)	Gregor Mendel is considered the founder of the science of genetics.
90)	The scientists George Beadle and Edward Tatum affirmed the the one gene – one enzyme hypothesis through their experiments.
91)	One gene- one enzyme hypothesis states that each gene produce a ,which is responsible for the occurrence of a chemical reaction that leads to the formation of a protein that expresses a specific hereditary trait.
92)	Water exists in three states Liquid , solid and gas .
93)	Water changes from a liquid state to a Gaseous state when it gains heat
94)	Water changes from a gaseous state to a liquid state at Low (cold) temperature in a process known as condensation .
95)	Sources of water vapor in nature include Oceans, seas, and transpiration from plants .
96)	Water Groundwater is stored underground.
97)	The basic stages of the water cycle are Evaporation, condensation, precipitation , surface runoff, and infiltration .
98)	Rocks are classified into three types are Igneous, sedimentary and metamorphic .
99)	Water freezing in cracks is one of the causes of Mechanical weathering that leads to the breaking of rocks.

- 100) Water freezing in cracks, **Weathering** and the thermal expansion and contraction of the minerals that make up rocks are causes of mechanical weathering.
- 101) Spherical weathering is one of **Chemical weathering** form
- 102) **Sandstone** and **limestone** are examples of sedimentary rocks.
- 103) Chemical substances such as **oxygen** and minerals found in groundwater cause chemical weathering.
- 104) Powdered **limestone (calcium carbonate)** is used to make casts for people with broken bones.
- 105) Sedimentary rocks are characterized by being **Layered** and containing **fossils**
- 106) When sedimentary rocks are exposed to **heat** and **pressure** they turn into metamorphic rocks.
- 107) When limestone rocks are exposed to heat and pressure, they turn into **Marble**.
- 108) When **sandstone** rocks are exposed to heat and pressure, they turn into quartzite rock.
- 109) Igneous rocks are classified into two types: **Plutonic (intrusive)** and **volcanic (extrusive)**.
- 110) Examples of metamorphic rocks are **Marble** and **quartzite**.
- 111) Basalt and **pumice/rhyolite** are igneous rocks.
- 112) **Granite** and **gabbro** are plutonic igneous rocks.
- 113) When sediments are subjected to compression and lithification, they turn into **Sedimentary rocks**.
- 114) When igneous rocks are subjected to **weathering** and **lithification**, they turn into sediments
- 115) Metamorphic rocks are formed when rocks **igneous** and **sedimentary** are exposed to heat and pressure
- 116) Natural gas is composed of **Methane** and represents 90% of its components.
- 117) **Weathering** is the process of breaking down and fragmenting rocks, while **Erosion** is the transport of sediments from one location and their sedimentation in another
- 118) Basalt is an **Surface** igneous rock, while granite is an **Plutonic** Igneous rock

3

give reason for (scientific explanation)

Unit 1

- 1) Calcium ($_{20}\text{Ca}$) is metal while Chlorine ($_{17}\text{Cl}$) is non-metal.
Because Calcium has 2 electrons in its last energy level (2, 8, 8, 2), while Chlorine has 7 electrons in its last energy level (2, 8, 7).

- 2) Carbon is used in the manufacture of dry columns even though it is not a metal.
Because it is a good conductor of electricity.
- 3) Calcium ($_{20}\text{Ca}$) is harder than sodium ($_{11}\text{Na}$).
Because Calcium has 2 valence electrons, while Sodium has only 1. The strength of the Metallic Bond increases as the number of valence electrons increases.
- 4) Bronze alloy is used in the manufacture of medals instead of copper.
Because Bronze is harder, stronger, and more resistant to rust than pure copper.
- 5) Magnesium milk is used to treat stomach acidity.
To neutralize gastric hyperacidity as it contains magnesium hydroxide $\text{Mg}(\text{OH})_2$
- 6) Litmus paper is not suitable for distinguishing between strong and weak acids.
Because it gives the same colour with both of them (red).
- 7) Distilled water does not affect litmus paper.
Because the number of H^+ cations equals the number of OH^- anions in the solution
- 8) A pH meter is more accurate than universal strips in determining the pH value of a solution.
Because pH meter device determines the pH value of any solution directly and accurately as indicated by the number displayed immediately on its digital screen, while universal indicator strips provide an approximate pH value.
- 9) It cannot sink in the Dead Sea.
Because the high percentage of the salts in water leads to increasing its density.
- 10) Metals are good conductors of electricity.
Because they contain free electrons that move freely throughout the metallic structure
- 11) Calcium is added to acidic soil.
To treat the acidic soil by calcium hydroxide
- 12) The color of hydrangea flowers changes depending on the type of soil.
Because the flowers turn blue when planted in acidic soil, while they turn red when planted in basic soil.
- 13) Chemical indicators only work in the presence of water.
Because the chemical indicators act, generally, only in aqueous medium
- 14) Occurrence of acid rain occurs.
Due to dissolution of nitrogen dioxide and sulphur dioxide in atmospheric water vapor
- 15) Hydrochloric acid is used in the digestion of food.
Because it participate in digestion process
- 16) Muscle tension occurs when there is a lack of oxygen in the muscles.
Due to accumulation of lactic acid in muscles

17) Copper is used in the manufacture of electrical wires.

Because it is good electrical conductor of electricity

18) Most alloys are not expressed in molecular form.

Bwcause the alloys are mixtures not compounds

19) The speed of the moving object decreases if it required longer time to cover the same distance.

Because the speed is inversely proportional to time at constant distance.

20) When the speed of an object increases, the covered distance at the same time increases.

Because the speed is directly proportional to distance at constant time.

21) A person pushing against a wall does not perform work.

Because the displacement equals zero.

22) A person pushing a shopping cart performs work.

Because the direction of the force applied is in the same direction of the motion.

23) The role of fuel within a car is similar to the role of food within a living organism.

Because the chemical energy found in food and fuel is the potential energy stored in the chemical bonds, released and converted into kinetic energy when a chemical reaction occurs.

24) The work done by a passenger car is less than the work done by a truck, even though they travel at the same speed.

bec mass of truck is more than car mass

25) The work required to stop a car moving at high speed increases.

bec as velocity of body increases the work done to stop it increases

26) The gravitational potential energy decreases when an object falls.

because Height decreases and $PE = w \times h$.

27) The mechanical energy remains constant while the object falls in the absence of friction.

because Loss in PE = gain in KE (Mechanical energy conserved).

28) The kinetic energy of the object = zero at maximum height.

because Velocity is zero at that point.

29) The work required to move a car increases as its mass increases.

Because kinetic energy is directly proportional to the mass of the object.

30) The High Dam has great importance in generating electricity in Egypt.

Because dams store water to rotate turbines and generate hydroelectric energy.

31) The mechanical energy of any object is a constant quantity that does not change.

Law of conservation of energy (Loss in PE = gain in KE).

Unit 3

32) The genes found on a single chromosome are different.

→ Because each gene controls a different trait.

33) DNA is known as a double helix.

→ Because it consists of two twisted strands.

34) Smooth hair is considered a hereditary trait, while learning to swim is an acquired trait.

→ Because smooth hair is inherited from parents, while swimming is learned from the environment.

35) A squirrel breaking a nut is considered an instinctive behaviour.

→ Because it is inherited and does not need learning.

36) Mendel is considered the founder of genetics.

→ Because he discovered the basic laws of inheritance.

37) Genes are considered responsible for the appearance of hereditary traits

Because genes consist of nucleotides and produce enzymes that make chemical reactions to form proteins expressing the trait.

38) A dark-skinned mother giving birth to an albino child is considered a spontaneous mutation

Because it is a mutation that occurs naturally without any human intervention.

39) Light skin color in people living in cold regions is a beneficial spontaneous mutation

Because it helps their bodies absorb more Vitamin D from limited sunlight, which is a desirable trait.

40) Producing cube-shaped watermelons is considered an agricultural technique and not a mutation

Because it is a change in the physical shape due to the environment and is not inherited or related to genes.

41) Lactose tolerance is considered a beneficial mutation

Because it is a desirable trait that allows people to digest milky products safely.

42) The production of featherless chickens is a beneficial induced mutation.

Because it helps in easier heat loss and faster growth in hot climates (economic benefit).

43) Eye color is considered a Genetic trait, while learning to walk is an acquired trait.

Eye color is inherited from parents, while walking is learned through practice.

44) Genes control the appearance of an individual's genetic traits.

Because genes produce enzymes that trigger chemical reactions to show the trait.

45) Fresh water consumption must be rationalized.

Unit 4

Because fresh water is limited and essential for the survival of living organisms.

46) Water droplets form on the outside of a cup containing water and ice cubes.

Because water vapor touches the cold cup surface, loses heat, and condenses.

47) The sun and gravity together maintain the continuity of the water cycle.

The Sun provides energy for evaporation, and Gravity pulls water back to Earth.

48) Some countries carry out desalination of sea and ocean water.

To compensate for the shortage of fresh water and meet increasing demand.

49) Yellowstone National Park is an example of chemical weathering.

Because hot springs and acids dissolve minerals in rocks, changing their chemical composition.

50) Water coming from Ethiopia appears brown.

Because it carries large amounts of silt and clay during flood seasons.

51) Erosion is both beneficial and harmful to the environment.

Beneficial because it forms fertile soil.

Harmful because it removes topsoil and destroys landscapes.

52) Sedimentary rocks are characterized by their porosity.

Because they contain tiny spaces (pores) between sediment grains.

53) Sedimentary rocks are porous.

Because of microscopic spaces between sediment particles.

54) Sedimentary rocks are characterized by the presence of fossils.

Because they form under low temperature and pressure.

55) The crystals of surface igneous rocks are small.

Because lava cools quickly.

56) The crystals of underground igneous rocks are large.

Because magma cools slowly underground.

4

what can be observed when(what happen if)

Unit 1

1) Hammering a piece of graphite

The piece of graphite crumbles easily because graphite is a brittle nonmetal (not malleable).

2) Increasing the number of valence electrons in metal atoms relative to the metallic bond

The metallic bond becomes stronger, and the metal becomes harder with a higher melting point.

3) Mixing molten gold with molten copper.

An alloy is formed whose properties differ from those of both metals.

4) Passing an electric current through sulphuric acid and acetic acid in relation to lighting a lamp

When the electric current passes in sulphuric acid solution the bulb becomes brighter, while when it passes in acetic acid solution the bulb becomes lower brightness

5) The reaction of acids with alkalis

A salt and water are formed.

- 6) Heat a piece of magnesium and add the result to water, then place a red litmus paper in the solution.
The red litmus paper will turn blue due to magnesium hydroxide solution ($\text{Mg}(\text{OH})_2$).
- 7) Melting sulphur oxides in rainwater
Sulphur trioxide (SO_3) is formed, which dissolves in water to produce sulphuric acid solution (H_2SO_4) causing acid rain
- 8) Place a piece of sugar in a test tube containing concentrated sulphuric acid.
The sugar becomes charred and black
- 9) Place a red and a blue sunflower paper in a tube containing hydrogen gas.
Both of them doesn't change in colour
- 10) Place a red and a blue sunflower paper in a tube containing chlorine gas.
The colour of both litmus strips (bleaches both of them).
- 11) Add calcium hydroxide to acidic soil.
To treat it from acidity and become suitable to planting
- 12) You dip two litmus strip in a cup containing an acidic solution.
The blue litmus strip change into red
- 13) You dip two litmus strip in a cup containing an alkaline solution.
The red litmus strip change into blue
- 14) Accumulation of lactic acid in muscles.
Muscle cramps occur.
- 15) Combustion of metal with oxygen.
The basic oxide will be formed
- 16) Melting of sulfur and nitrogen oxides in water vapor in the atmosphere.
This causes the precipitation of the acid rains.
-
- 17) Increasing in body weight relative to its potential energy.
The potential energy will increase
- 18) Decreasing in distance traveled during the same time.
The speed will decrease
- 19) Strong impact on an object with zero displacement.
The work done = zero because : $W = F \times d = F \times 0 = 0$
- 20) Vehicles exceed the permitted speed limits.
This results in increasing the road accidents.
- 21) A moving object covers the same distance it travelled in half the time (Regarding its speed).
The speed of the moving object doubles.
- 22) Exerting a suitable force on a stationary object (an object at rest).
The object moves for a certain displacement in the same direction of the force.
- 23) The force which affects an object increases in the direction of its movement (Regarding the work done).
The work increases.
- 24) The weight of an object is doubled while its height above the ground remains constant (Regarding its potential energy).
The potential energy doubles.

25) The vertical distance to which the object is lifted above the ground decreases to half while its weight remains constant (Regarding its potential energy).

The potential energy decreases to half.

26) The speed of a moving object doubles while its mass remains constant, in relation to its kinetic energy

Speed doubles → Kinetic energy increases four times.

27) The mass doubles and the speed less than half, in relation to kinetic energy

Speed becomes half → Kinetic energy decreases to half

(Because $2 \times (\frac{1}{2})^2 = \frac{1}{2}$).

28) The speed of a moving object is doubled, while its mass remains constant (in terms of kinetic energy).

Kinetic energy increases four times.

29) An object falling from a height (in terms of potential and kinetic energy).

Potential energy decreases and kinetic energy increases.

30) A pendulum passing through a position of rest (in terms of potential and kinetic energy).

Kinetic energy becomes maximum and potential energy becomes minimum.

31) Two cars (1 and 2) with the same mass move at two different speeds, in relation to kinetic energy

Comparing two cars → The car with higher speed has greater kinetic energy.

32) Lack of food sources in a balanced ecosystem

Unit 3

The ecological balance is disturbed, leading to competition, migration, or death of some organisms.

33) Food shortage for a group of hyenas

They will face intense competition, search for alternative food sources, or move to a different territory.

34) The absence of one living organism present in a balanced ecosystem.

The ecological balance is disturbed and the food chain is broken.

35) An increasing in the number of primary consumers in the food chain.

The number of producers decreases and secondary consumers find more food.

36) Lack of food sources among members of biotic population.

Members compete, some migrate or die, leading to a decrease in population.

37) A difference in the order of nucleotides in a single chromosome

A mutation occurs → It leads to a change in the genetic code and the appearance of a new trait.

38) The formation of genes for certain enzymes

Production of specific enzymes → Chemical reactions occur forming proteins that show genetic traits.

39) Placing watermelons in square-shaped metal molds when they grow

Watermelons take a square shape → It is an acquired physical change due to agricultural techniques, not a mutation.

40) Variation in the arrangement of nucleotides on DNA.

A mutation occurs, which may lead to a change in the resulting protein .

Unit 4

41) Fill a water bottle to the brim and place it in the refrigerator for several hours.

Water expands when it freezes, causing the bottle to burst.

42) Water freezes in the cracks between rocks.

It expands and breaks the rock.

43) Water flows between rocks.

It causes physical erosion and chemical weathering.

44) The temperature of the minerals that make up the rocks drops at night.

Minerals contract, leading to cracking.

45) Plant roots grow inside the cracks between the rocks.

They widen the cracks and split the rock.

46) Adding drops of hydrochloric acid to a piece of limestone.

Effervescence occurs due to CO₂ release.

47) Bring a match close to the gas produced by adding the acid to the limestone.

The flame goes out because CO₂ does not support combustion.

48) Placing a cup of water in a sunny place for several hours.

Water will evaporate and the amount in the cup will decrease.

49) Placing pieces of ice in a cup of water.

Water temperature will decrease and droplets will form on the cup surface.

50) The water cycle suddenly stops.

Life on Earth would cease because fresh water would not be renewed.

51) When the temperature of the clouds is below freezing.

the snow precipitation will occur instead of rain

52) When small ice crystals gather during thunderstorms.

the hail precipitation will occur

53) Limestone rocks being exposed to heat and pressure.

They turn into marble (metamorphic rock).

54) Magma rising to the Earth's surface.

It cools quickly forming volcanic (extrusive) igneous rocks like basalt.

55) Magma intruding between cracks and layers in the Earth.

It cools slowly forming plutonic (intrusive) igneous rocks like granite.

5

Answer the following

Unit 1

- 1) Choose the odd word (or phrase) out, then mention the relation between the rest:
- f. Gold / Silver / **Bromine** / Mercury The others are metals (Bromine is a liquid non-metal).
 - g. Phosphorus / Bromine / **Mercury** / Sulfur The others are non-metals (Mercury is a liquid metal).
 - h. Graphite / **Bromine** / Phosphorus / Sulfur The others are solid non-metals (Bromine is liquid).
 - i. Iodine / Sulfur / Carbon / **Hydrogen** The others are solid non-metals (Hydrogen is a gas)
 - j. Bronze / **Chlorine** / Copper / Tin The others are metals (Chlorine is a gaseous non-metal).
- 2) What is the benefit of recycling metal waste?
- 1- Decreasing of their abundance (percentage) in the Earth's crust.
 - 2- Difficulty of extracting them from their ores.
 - 3- The lower cost of recycling them compared to extracting them from their ores.
- 3) Two elements (A, B) their melting points is ($1538^{\circ}\text{C} - 115.21^{\circ}\text{C}$)
- A- What type are they? Explain your answer.
Element (A) is a Metal (high melting point). Element (B) is a Non-metal (very low melting point).
- B - Which one is a good conductor of electricity?
Element (A).
- C - Which one can be hammered and drawn?
Element (A).

Unit 2

- 4) Calculate the time taken by a car moving at a speed of 40 m/s to cover a distance of 200 m
- $$t = \frac{d}{v} = \frac{200}{40} = 5\text{ s}$$
- 5) Calculate the height of an object of mass 6 kg above the ground when its potential energy is 180 J , knowing that the gravitational field intensity is 10 N/kg
- $$w = m \times g = 6 \times 10 = 60\text{ N}$$
- $$h = \frac{PE}{w} = \frac{180}{60} = 3\text{ m}$$
- 6) Calculate the speed of an object that covers distance of 50 km in 2 h .
- $$v = \frac{d}{t} = \frac{50}{2} = 25\text{ km/h}$$
- 7) A person pushes an object with a force of 40 N , causing it to move in a straight line for a distance of 10 m . Calculate the amount of work done.
- $$w = f \times s = 40 \times 10 = 400\text{ J}$$

- 8) Calculate the potential energy of an object with a mass of 15 kg at a height of 150 cm, given that the acceleration due to gravity is 10 m/s^2 .

$$PE = m \times g \times h = 15 \times 10 \times \left(\frac{150}{100}\right) = 225 \text{ J}$$

- 9) An object moves at a speed of 20 km/h. Calculate the distance traveled after 3h.

$$d = v \times t = 20 \times 3 = 60 \text{ km}$$

- 10) An object exerted a work of (50 J) to move a wheel a distance of (10 m). Calculate the amount of force required to exert the work.

$$F = \frac{\text{Work}}{\text{distance}} \quad F = 50 \div 10 = \boxed{5 \text{ Newton}}$$

- 11) An object has a potential energy (240 J) at a height of (12 m). Calculate the weight of the object.

$$W = \frac{PE}{h} \quad W = 240 \div 12 = \boxed{20 \text{ Newton}}$$

- 12) What factors determine potential energy?

weight (w) of the object and Height (h) above the ground

- 13) What is the relationship between work and both force and displacement?

Work is directly proportional to both force and displacement.

- 14) What mathematical relationship is used to calculate velocity?

$$v = \frac{d}{t}$$

- 15) What mathematical relationship is used to calculate work? **$w = f \times s$**

- 16) What mathematical relationship is used to calculate potential energy given weight?

$$PE = w \times h$$

- 17) What mathematical relationship is used to calculate potential energy given mass?

$$PE = m \times g \times h$$

- 18) What are the conditions for doing work?

- **A force must be applied on the object**
- **The object must have a displacement in the same direction of the force**

19) Problems

- 1- Calculate the mass of an object whose kinetic energy is (0.5 kJ) and whose speed is (5 m/s).

$$0.5 \times 1000 = 500 \text{ J}$$

$$M = 2KE / V^2 = 2 \times 500 / (5)^2 = 40 \text{ Kg}$$

- 2- Calculate the speed of a ball with a mass of (600 g) and kinetic energy of (100 J).

$$M \text{ } 600 / 1000 = 0.6 \text{ Kg}$$

$$V = \sqrt{2KE / M} = \sqrt{2 \times 100 / 0.6} = 18.25 \text{ m/s}$$

3- An object with a mass of (8 kg) moves at a speed of (4 m/s). Calculate the kinetic energy of the object if its mass doubles while its speed remains constant.

M 8 double 16

$$\text{K.E} = \frac{1}{2} M \times V^2 = \frac{1}{2} \times 16 \times (4)^2 = 128 \text{ j}$$

4- An object with a mass of (10 kg) moves at a speed of (3 m/s). Calculate the kinetic energy if its speed doubles while its mass remains constant.

v 3 double 6

$$\frac{1}{2} \times 10 \times (6)^2 = 180 \text{ j}$$

5- Calculate the kinetic energy of a ball with a mass of (20 kg) moving at a speed of (4 m/s).

$$\text{K.E} = \frac{1}{2} M \times V^2$$

$$\frac{1}{2} \times 20 \times 4^2 = 160 \text{ J}$$

6- Calculate the kinetic energy of an object with a weight of (20 N) moving at a speed of (6 m/s).

$$M = W/10 = 20/10 = 2 \text{ Kg}$$

$$\text{K.E} = \frac{1}{2} M \times V^2$$

$$\frac{1}{2} \times 2 \times 6^2 = 36 \text{ J}$$

7- Calculate the kinetic energy of an object with a mass of 500 g covering a distance of 20 m in 4 s.

$$M = 500 \text{ g}$$

$$500 / 1000 = 0.5 \text{ kg}$$

$$V = d/t = 20 / 4 = 5 \text{ m/s}$$

$$\text{K.E} = \frac{1}{2} mv^2$$

$$\text{K.E} = \frac{1}{2} \times 0.5 \times (5)^2 = 6.25 \text{ J}$$

8- An object slides from a height of 2 m. If its mass is 2 kg, calculate the total mechanical energy at the starting point.

$$\text{M.E} = \text{P.E} + \text{K.E. At the starting point, K.E} = 0, \text{ so}$$

$$\text{M.E} = \text{P.E} = m \times g \times h = 2 \times 10 \times 2 = 40 \text{ Joules.}$$

9- A ball with a mass of 0.5 kg falls from a height of 15 m. Calculate its kinetic energy at the moment it reaches the ground if the mechanical energy is constant.

$$\text{K.E} = m \times g \times h = 0.5 \times 10 \times 15 = 75 \text{ Joules.}$$

10- An object with a mass of 2 kg falls from a height of 8 m. Calculate both the potential energy and kinetic energy at the following positions:

A. At the point of fall. B. At the midpoint of the distance.

$$\text{A) At the point of fall: P.E} = 160 \text{ J and K.E} = 0 \text{ J.}$$

$$\text{B) At the midpoint: P.E} = 80 \text{ J and K.E} = 80 \text{ J.}$$

- 20) Calculate the kinetic energy of an object of mass 12 kg moving with a speed of 1 m/s

$$KE = \frac{1}{2} \times m \times v^2$$

$$= \frac{1}{2} \times 12 \times (1 \times 1) = 6J$$

- 21) An object its mass is 600 g is thrown upwards vertically at a speed of 20 m/s Calculate : [Given that : 1000 g m 1 kg]

(1) The kinetic energy of the object at the moment of being thrown upwards

$$(1) m = \frac{600}{1000} = 0.6 \text{ kg}$$

$$KE = \frac{1}{2} \times m \times v^2$$

$$= \frac{1}{2} \times 0.6 \times (20 \times 20) = 120J$$

(2) The mechanical energy of the object at the maximum height it reaches.

(2) The mechanical energy at the maximum height reached by the object = Kinetic energy at the moment it is thrown upwards.

$$ME = KE = 120 J$$

- 22) Calculate the kinetic energy of a plastic ball with a mass of 4 kg moving at a speed of 2 m/s.

$$KE = \frac{1}{2} \times 4 \times 2^2 = 8 J$$

- 23) Calculate the mechanical energy of an object with kinetic energy of 4 J and potential energy of 5 J.

$$ME = 4 + 5 = 9 J$$

- 24) When is?

1 - Kinetic energy = zero.

1. Kinetic energy = zero → When the object is at its maximum height (at rest).

2 - Kinetic energy is numerically equal to twice the mass of the object.

2. Kinetic energy = twice the mass → When velocity $v = 2 \text{ m/s}$

(Since $KE = \frac{1}{2} m v^2$).

- 25) Determine the importance or function of each of the following:

1- Converting potential energy into kinetic energy in dams?

Generating electricity.

2- The rubber band in a slingshot?

Storing potential energy to launch objects.

3- Distributing the weight of objects evenly across the leg muscles when lifting them off the ground.

Protecting the back bone from injury.

- 26) What does it mean that: The kinetic energy of an object is 250J.

→ It means the work done during the motion of this object equals 250 Joules.

27) Create food chains and food webs from the following organisms:

1- Carrot - Shrimp - Grass - Seal - Wheat - Deer - Mouse - Rabbit - Bacteria and Fungi - Sparrow - Fox - Falcon - Snake - Fish - Bear - Algae - Lion

Food Chains and Food Webs Examples

A) Land Food Chain:

Grass → Rabbit → Fox → Lion

2- Carrot - Shrimp - Grass - Seal - Wheat - Deer - Mouse
- Rabbit - Sparrow - Fox - Falcon - Snake - Fish - Bear
- Algae - Lion.

B) Water Food Chain:

Algae → Shrimp → Fish → Seal → Bear

28) Problem: Calculate the amount of transferred energy which reaches to third level if the energy at the first level is equal to 1000J.

Given: **Energy at the first trophic level = 1000 J**

Rule: **Only 10% of energy is transferred to the next level.**

-The energy which reaches the second level = $1000 \times 10\% = 100 \text{ J}$

-The energy which reaches the third level = $100 \times 10\% = 10 \text{ J}$

29) What is the hypothesis which the two scientists Beadle and Tatum affirmed ? **What does it mean ?**

One gene - One enzyme hypothesis, which states that each gene produces a specific enzyme responsible for the occurrence of a chemical reaction that leads to the formation of a protein that expresses a specific hereditary trait.

30) What is the effect of killing hawks on the number of earthworms in a food chain consisting of grasses, hawks, earthworms and snakes ?

The number of snakes increases, this the number of earthworms decreases.

31) What is the type of the nutritional relationship between each of the following:

(1) The wolf and the rabbit.

(2) The fly and the Dionea plant.

(3) The polar bear and the seal.

1,2,3 Predation

32) Mention the type of food relationship in each of the following:

Unit 3

1) The remora fish that sticks to the shark's body and gets its food remains without affecting it on the shark.

commensalism

2) The falcon that hunts mice.

predation

3) The trees in the forest are densely packed together, blocking light from the short trees.

competition

4)	Spiders hunt insects	predation
5)	Algae live inside the coral tissues	mutualism
6)	Lions and hyenas compete for gazelles or zebra.	competition
7)	A genetic trait.	Eye color.
8)	An induced mutation.	production of Featherless chickens
9)	An acquired trait.	Playing football
10)	A spontaneous mutation.	albino child
11)	A carnivore.	lion
12)	A competition relationship.	Two lions for food (Zebra)
13)	A commensalism relationship.	Egyptian Plover bird and the Nile Crocodile
14)	A decomposer.	Fungi (or bacteria)
15)	An omnivore.	Bear
16)	A scavenger.	Eagle
17)	A producers.	plant or algae
18)	The sun in the water cycle in nature	Main energy source driving the water cycle.
19)	Gravity in the water cycle in nature	Pulls water downward and helps rivers flow.
20)	Wind in the water cycle in nature	Moves clouds and water vapor.
21)	The water cycle in nature	Renews fresh water and regulates Earth's temperature.

Unit 4

Unit 4

33) What processes lead to the transformation of:

(1) Limestone rocks into marble rocks ?

High pressure and heat.

(2) Quartzite rocks into sandstone rocks ?

Weathering, erosion and lithification.

34) Explain the role of living organisms in the water cycle.

The plant is considered a source of water vapour through the transpiration process, while human and animals are considered a source of water vapour through the evaporation of sweat.

35) Why is the boiling point **considered** a characteristic property of pure substances, not evaporation?

Because boiling process occurs at a specific temperature, while evaporation process occurs at any temperature.

36) Classify the following according its type(genetic traits, acquired traits,or instinctive behaviors):

- | | |
|--|-------------------------------------|
| 1-Reading and writing. | 2- The length of a giraffe's neck. |
| 3- A squirrel breaking a hazelnut shell. | 4- Learning to swim. |
| 5- A spider weaving its web. | 6- The short legs of an arctic fox. |
| 7- Learning the Indian language. | 8- Birds laying on eggs. |
| 9- A horse jumping over obstacles. | 10- Facial freckles. |
| 11- Breast feeding. | 12- Blood type. |
| 13- A dolphin playing ball. | |
| 14- A bat sleeping upside down. | |
| 15- Hair color. | |

Genetic Traits:	Acquired Traits:	Instinctive Behaviors:
Length of giraffe's neck Short legs of arctic fox Facial freckles Blood type Hair color	Reading and writing Learning to swim Learning Indian language Horse jumping over obstacles Dolphin playing ball	Squirrel breaking hazelnut Spider weaving web Birds laying eggs Breast feeding Bat sleeping upside down

37) Arrange the following sentences in the correct order of the water cycle in nature by placing the numbers (1-5) in front of the appropriate sentence:

- (3) Condensation of water droplets in clouds
- (1) Heating of the ocean surface by heat of sun and evaporation of water.
- (2) Air currents in contact with the earth's surface carry water vapor upward
- (4) Water precipitates on high ground on the earth
- (5) Water droplets fall to the earth in the form of liquid water or snow.

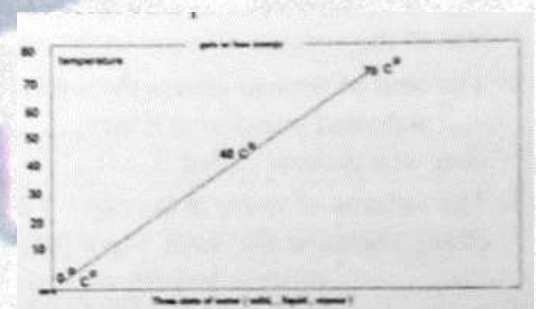
38) Look at the graph in front of you:

- Explain the process of water transformation when it loses or gains thermal energy.

- From solid (ice) to liquid → Melting
- From liquid to gas → Evaporation

When water loses thermal energy, it changes:

- From gas to liquid → Condensation
- From liquid to solid → Freezing



39)	(A)	(B)
(5)	Water movement in different pathways in different ecosystem.	1 Run off
(4)	Water in its liquid state absorbs thermal energy and turns into water vapor.	2 Depositions
(3)	Water vapor loses thermal energy and turns into liquid water.	3 condensation
(2)	Water falls to the surface of the earth due to gravity.	4 evaporation
(1)	Water flows down highlands and descends into seas and rivers.	5 Water cycle

6

choose the correct answer

Unit 1

1) All the following are properties of sodium element, except that it

- A) is a metal. B) has metallic luster.
C) is a bad electrical conductor. D) is formable.

2) Which of the following is the correct arrangement of the hardness of sodium $_{11}\text{Na}$, magnesium $_{12}\text{Mg}$ and aluminum $_{13}\text{Al}$?

- A) $\text{Na} > \text{Mg} > \text{Al}$ B) $\text{Al} > \text{Mg} > \text{Na}$
C) $\text{Mg} > \text{Na} > \text{Al}$ D) $\text{Al} > \text{Na} > \text{Mg}$

3) Element (X) its boiling point is 2807°C and its melting point is 1064°C . Which of the following is a property of element (X)?

- A) Bad electrical conductor. B) Brittle.
C) Formable. D) Opaque.

4) Which of the following questions helps in the classification of some elements to metals and nonmetals?

- A) Is it solid? B) Is it liquid?
C) Is it coloured? D) Is it brittle?

5) What is the common property of both sodium and copper?

- A) Colour. B) Density.
C) Melting point. D) Physical state.

- 6) If the anion which composes the acid HClO is called hypochlorite, then the acid is called
- A) hypochlorous acid. B) hypochloric acid.
C) perchloric acid. D) chlorous acid.
-
- 7) What is the ion whose percentage in the solution increases when an acidic oxide dissolves in water?
- A) H^+ B) OH^- C) Cl^- D) H^+
-
- 8) Element (X) forms the oxide XO which reacts with acids. Which of the following represents (X) and XO ?
- A) (X): Metal, XO : Acidic oxide. B) (X): Nonmetal, XO : Acidic oxide.
C) (X): Metal, XO : Basic oxide. D) (X): Nonmetal, XO : Basic oxide.
-
- 9) On dissolving calcium oxide in water and placing two litmus strips in the solution , the colour of one of them changes into
- A) red. B) purple. C) blue. D) yellow.
-
- 10) Which of the following are properties of solid sodium hydroxide ?
- A) It dissolves in water, and reacts with HCl acid.
B) It dissolves in water, and does not react with HCl acid.
C) It does not dissolve in water and does not react with HCl acid.
D) It does not dissolve in water and reacts with HCl acid.
-
- 11) A red litmus strip is placed in solution (1), so no change in colour occurs, when it is placed in solution (2), it becomes blue.
- Which of the following is correct?
- A) Solution (1): Neutral , Solution (2): Acidic.
B) Solution (1): Acidic , Solution (2) Neutral.
C) Solution (1): Acidic , Solution (2) Alkaline.
D) Solution (1): Alkaline , Solution (2): Acidic.
-
- 12) The colour of the universal indicator is the same in both
- A) tomato juice and hydrochloric acid.
B) distilled water and sodium chloride solution.
C) tomato juice and sodium hydroxide solution.
D) distilled water and hydrochloric acid.
-

13) All the following from ions that form salts, except

- A) OH^- B) Cl^- C) NH_4^+ D) NO_3^-

14) All the following are properties of solid sodium carbonate salt, except that

- A) it dissolves in water. B) pH of its solution is higher than 7
C) its colour is white. D) it conducts electricity.

15) pH value of a solution is changed from 8 to 5, that means it was

- A) acidic and becomes alkaline. B) acidic and becomes neutral.
C) alkaline and becomes neutral. D) alkaline and becomes acidic.

16) Which of the following cases involves doing work?

- A) Lifting a bag from the floor, pushing a shopping cart.
B) Carrying a backpack while walking, pushing a shopping cart.
C) Lifting a bag from the floor, pushing a tree.
D) Carrying a backpack while walking, pushing a tree.

17) The potential energy of an object depends on

- A) its weight and speed.
B) its weight and mass.
C) its weight and height above the ground.
D) its speed and height above the ground.

18) Which of the following nutritional relationships causes harm the organisms ?

Unit 2

- (a) Predation and competition. (b) Mutualism and commensalism
(c) Mutualism and predation. (d) Predation and commensalism.

19) In a food chain that includes insect, fish, plant and swan.

Which of these living organisms is considered as a predator and a prey at the same time ?

- (a) The insect. (b) The fish. (c) The plant. (d) The swan.

20) Millions of nucleotides come together directly, forming

- (a) chromosomes. (b) chromatids. (c) genes. (d) histones

21) Which of the following represents harmful natural mutations and which represents beneficial spontaneous mutations, respectively?

- (a) Muscular dystrophy in children, seediness grapes.
- (b) Muscular dystrophy in children, lactose tolerance.
- (c) Six fingered hand, lactose tolerance.
- (d) Six fingered hand, cubie-shaped oranges.

22) What is the composition of the mixture which is used to separate strawberry chromosomes?

- (a) Salt, dishwashing liquid and water only.
- (b) Salt, ethyl alcohol and water only.
- (c) Dishwashing liquid and ethyl alcohol only.
- (d) Salt, dishwashing liquid and ethyl alcohol

23) Clouds and rain are formed through the processes of

Unit 4

- (a) condensation and precipitation.
- (b) condensation and evaporation.
- (c) evaporation and surface runoff.
- (d) precipitation and surface runoff.

24) A person wearing wet clothes feels cold, despite the warm weather, because

- (a) water loses heat when it evaporates.
- (b) water gains heat when it evaporates.
- (c) water vapour loses heat when it condenses.
- (d) water vapour gains heat when it condenses.

25) What are the two processes that occur at any temperature ?

- (a) Melting and boiling.
- (b) Evaporation and condensation.
- (c) Melting and evaporation.
- (d) Evaporation and boiling.

26) The three types of rocks are classified according to ...

- (a) the way they are formed.
- (b) the depth at which they are found.
- (c) their chemical properties.
- (d) their relative age.

27) Metamorphic rocks are formed through the processes of ..

- (a) melting and crystallization.
- (b) transportation and sedimentation.
- (c) heat and pressure.
- (d) erosion and weathering

28) The rock cycle is a model that illustrates

- (a) the unchanging of rocks
- (b) how magma is formed
- (c) how sediments are formed.
- (d) transformations of rocks.

29) Which of the following illustrates the correct sequence for the formation of sandstone rocks ?

- (a) Weathering → Transportation → Sedimentation.
- (b) Erosion → Weathering → Sedimentation
- (c) Melting → Cooling → Crystallization
- (d) Pressure → Heat → Crystallization.

7

Define the following (what is meant by)

Unit 1

1)	Metal	A substance in which the outermost energy level of the atom contains 1, 2 or 3 electrons.
2)	Nonmetal	A substance in which the outermost energy level of the atom contains - mostly - 5, 6 or 7 electrons.
3)	Metallic bond	The (electrostatic) attraction force between the positive metal ions and the negative valence electron cloud which surrounds them.
4)	Alloy	A mixture composed of the melts of two or more metals.
5)	Recycling	The process of the conversion of the wastes into new usable substances.
6)	Atomic group	An ion composed of more than one atom of more than one element.
7)	Acid	A substance whose dissolution in water (dissociation) increases the percentage of hydrogen cations (H^+) in the solution.
8)	Alkali	A substance whose dissolution in water (dissociation) increases the percentage of hydroxide anions (OH^-) in the solution.
9)	Basic oxides	Metal oxides, some of which dissolve in water forming alkalis.
10)	Acidic oxides	Nonmetal oxides that dissolve in water forming acids.
11)	Acid rains	Rain resulting from the dissolution of acidic oxides in atmospheric water vapour.
12)	Indicators	Chemical substances whose colour differs in acidic medium from that in alkaline medium.
13)	Universal indicator	An indicator that can differentiate between acids and alkalis Universal indicator or between different acids or different alkalis, based on their pH value Salts strength.

14)	pH value	A scale ranging between the values 0 to 14, used to determine the acidity and the basicity of solutions.
15)	Salts Unit 2	✓ Ionic compounds formed by the combination of an alkali cation with an acid anion. Ionic compounds produced from the reactions of acids with alkalis.
16)	Path of movement	A set of points that the object passes through its motion.
17)	Distance (d)	The total length of any path taken by the object while moving from the starting point to the end point.
18)	Displacement (s)	The shortest straight path connecting between the starting point and the end point in a constant direction.
19)	Speed (v)	The distance covered per unit time.
20)	Work (W)	The amount of energy required to move an object through a certain displacement in the same direction of the force which acts on it.
21)	Controlling the variables	One of the skills in scientific researching and designing scientific comparative experiments.
22)	Independent variable (Cause)	The variable which is changed during the experiment.
23)	Dependent variable (Effect)	The variable to be tested, which is being changed in response to changing the independent variable.
24)	Controlled variables	The variables that are controlled to remain constant throughout the experiment.
25)	Energy (E)	The ability to do work.
26)	Potential energy (PE)	The energy stored in an object as a result of the work done on it
27)	The distance covered by an object equals 20 m	This means that the total length of the path taken by this object while moving from the starting point to the end point equals 20 m
28)	The displacement of an object equals 10 m	This means that the length of the shortest straight path connecting between the starting point and the end point of this object in a constant direction equals 10 m
29)	The speed of an object is 100 m/s	This means that this object covers a distance of 100 m in 1 second.
30)	A moving car covers a distance of 20 km in 2 h	This means that the speed of this car equals 10 km/h $V = \frac{d}{t} = \frac{20}{2} = 10 \text{ km/h}$
31)	The potential energy of an object is 20 J	This means that the energy stored in the object as a result of the work done on it is 20 J

32)	An object with potential energy of 80 J is at a height of 10 m	This means that the weight of the object equals 8 N $W = \frac{PE}{h} = \frac{80}{10} = 8 \text{ N}$
33)	Mechanical energy	The sum of potential energy and kinetic energy of an object.
34)	Kinetic energy	"The work done during the motion of an object" → It means Kinetic Energy.
35)	The ecosystem	A natural area containing living organisms and non-living components that interact with each other.
36)	Nutritional Relationships	The various ways (like predation or symbiosis) that organisms use to obtain energy and food from one another.
37)	Commensalism	A relationship between two organisms where one benefits and the other is neither benefits nor harmed.
38)	Mutualism	A relationship between two different species where both organisms benefit from each other.
39)	Predation	A nutritional relationship between two organisms, one of them benefits (the predator), while the other is harmed or loses its life (the prey).
40)	Food chain	A single pathway showing how energy moves from one living thing to another.
41)	The individual	A single living organism representing a specific species.
42)	Bio community	All the populations of different species living and interacting in a specific area.
43)	Competition	A nutritional relationship between two individuals of the same species for a food resource that exists in limited quantities, which negatively impacts their growth or survival.
44)	Ecosystem	The community of living organisms interacting with the non-living components of their environment.
45)	Biological control	A method of controlling pests using other living organisms.
46)	Energy pyramid	A pyramid that represents the flow of energy and its amounts between the different trophic levels in any food chain.
47)	Genetics	The science that studies heredity and inherited traits.
48)	Inherited traits	Traits passed from parents to offspring through genes.
49)	Instinctive behaviors	Behaviors transmitted from parents to offspring without learning.
50)	Acquired traits	Traits gained from the environment and not inherited.
51)	Chromosomes	Thread-like bodies that represent the genetic material of the eukaryotic organisms, which are responsible for the transmission of genetic traits from parents to offspring.

Unit 3

52)	Mutation	The emergence of a new hereditary trait that did not previously exist, as a result of a change in the nature of the gene responsible for it.
53)	Spontaneous mutation	A mutation that occurs naturally without human intervention (caused by environment or radiation).
54)	Induced mutation	Mutations that occur through human intervention.
55)	The centromere	The point of connection between the two chromatids of one chromosome.
56)	Reproduction	The process by which living organisms produce new individuals to ensure continuity of the species.
57)	Evaporation	The process by which liquid water changes into water vapor (gas) due to heat.
58)	Condensation	The process by which water vapor cools down and changes back into liquid water droplets.
59)	Infiltration	The process by which water on the ground surface enters the soil.
60)	Run off	The flow of water over the Earth's surface.
61)	Precipitation	Rain, snow, or hail falling from clouds.
62)	Transpiration	The evaporation of water from plant leaves.
63)	Boiling	Rapid change from liquid to gas at a specific temperature.
64)	Water cycle	Continuous movement of water on, above, and below Earth's surface.
65)	Transpiration	Evaporation of water from plant leaves. Main energy source driving the water cycle.
66)	Rocks	Solid materials composed of one or several minerals.
67)	Weathering	Sedimentary, igneous and metamorphic. Sedimentary, igneous and metamorphic.
68)	Mechanical weathering	The process of breaking down and fragmenting the rocks without any change in their chemical structure.
69)	Chemical weathering	The process of breaking down and fragmenting rocks with a change in their chemical structure.
70)	Erosion	The processes of transportation and sedimentation of the rock fragments resulting from weathering away from the areas where they were originally found
71)	Lithification	The compaction of sediments over the years into layers forming sedimentary rocks

Unit 4

8

compare between eqch of the following

Unit 1

1) Phosphorus - Iron

Property	Phosphorus (Non-metal)	Iron (Metal)
Metallic Luster	<u>opaque (No luster)</u>	<u>Has a shiny metallic luster</u>
Malleability and ductility	<u>Not malleable and ductile</u>	<u>Malleable and ductile</u>
Electrical Conductivity	<u>Bad conductor</u>	<u>Good conductor</u>
Melting point	<u>Low</u>	<u>High</u>

2) Sodium and graphite

Comparison Point	Sodium	Graphite
a) Metallic Luster	<u>Have metallic luster (Shiny)</u>	<u>Do not have metallic luster (opaque)</u>
Which is Opaque (Dull)?	<u>Not opaque</u>	<u>Opaque</u>

3) Sulphur and copper

Property	Sulfur	Copper
Malleability & Ductility	<u>Non-malleable</u>	<u>malleable and ductile</u>
Which is Brittle?	<u>Brittle</u>	<u>Not brittle</u>

4) Silver and phosphorus

Property	Silver (Metal)	Phosphorus (Non-metal)
Electrical Conductivity	<u>Good electrical conductor</u>	<u>Bad electrical conductor</u>

5) Metals and nonmetals

	Metals	Nonmetals
Electrons in the last energy level	<u>Less than 4 electrons (1, 2 or 3 electrons)</u>	<u>More than 4 electrons (5, 6 or 7 electrons)</u> <u>Except for hydrogen 1 electron and carbon 4 electrons</u>
Physical state	<u>All of them are solids, except mercury element (liquid)</u>	<u>They are either solids or gases, except bromine element (liquid)</u>
Metallic luster	<u>They have metallic luster (shiny)</u>	<u>They do not have metallic luster (opaque)</u>
Ductility, malleability formability	<u>They are ductile, malleable and formable</u>	<u>They are not ductile, malleable or and (brittle)</u>

Conductivity of heat and electricity	<u>Good conductors of heat and electricity</u>	<u>Bad conductors of heat and electricity, except for graphite, which is a good conductor of electricity</u>
Melting points	<u>High melting points</u>	<u>Low melting points</u>
Examples	- Aluminum Al - Lithium Li - Zinc Zn - Iron Fe - Potassium K	- Magnesium Mg - Copper Cu - Silver Ag - Calcium Ca - Mercury Hg
		- Carbon (Graphite) C - Sulphur S - Phosphorus P - Fluorine F - Nitrogen N
		- Bromine Br - Oxygen O

6) Acid and alkali

	Acid	Alkali
Definition	<u>A substance whose dissolution (dissociation) in water increases the percentage of hydrogen cations H^+ in the solution</u>	<u>A substance whose dissolution (dissociation) in water increases the percentage of hydroxide anions OH^- in the solution</u>
Effect on litmus strips	<u>Turns blue litmus strip to red</u>	<u>Turns red litmus strip to blue</u>
Examples	- HCl HNO_3 H_2SO_4	- KOH - NaOH NH_4OH

7) HCl and NaOH

	HCl	NaOH
Type of compound	<u>Strong acid</u>	<u>Strong alkali</u>
Result of each of the dissociation of each them	<u>H^+ cations and Cl^- anions are formed</u>	<u>Na^+ cations and OH^- anions are formed</u>
Effect of each of them on litmus strip	<u>Turns blue litmus strip to red</u>	<u>Turns red litmus strip to blue</u>

8) strong acids and weak acids

Strong acids	Weak acids
<u>Acids that are good electrical conductors</u>	<u>Acids that are weak electrical conductors</u>
<u>Examples :</u> <u>Hydrochloric acid.</u> <u>Nitric acid.</u> <u>Sulphuric acid.</u>	<u>Examples :</u> <u>Vinegar (dilute acetic acid).</u> <u>Nitrous acid.</u> <u>Sulphurous acid.</u>

9) Strong alkalis and weak alkalis

Strong alkalis	Weak alkalis
<u>Alkalis that are good electrical conductors.</u>	<u>Alkalis that are weak electrical conductors.</u>
<u>Examples : Sodium hydroxide solution.</u>	<u>Examples : Ammonium hydroxide solution.</u>

10) Basic oxides and Acidic oxides

	Basic oxides	Acidic oxides
Definition	<u>Metal oxides, some of which dissolve in water forming alkalis</u>	<u>Nonmetal oxides that dissolve in water forming acids</u>
The result of dissolving each of them in water	<u>Alkalis</u>	<u>Acids</u>
Examples	❖ <u>Magnesium oxide</u> MgO ❖ <u>Calcium oxide</u> CaO ❖ <u>Sodium oxide</u> Na ₂ O ❖ <u>Potassium oxide</u> K ₂ O	❖ <u>Sulphur dioxide</u> SO ₂ ❖ <u>Sulphur trioxide</u> SO ₃ ❖ <u>Nitrogen dioxide</u> NO ₂ ❖ <u>Carbon dioxide</u> CO ₂

11) Ammonium chloride, Sodium chloride and Sodium carbonate solution

	Ammonium chloride solution	Sodium chloride solution	Sodium carbonate solution
pH of the solution	<u>Less than 7</u>	<u>Equal to 7</u>	<u>Greater than 7</u>
Type of solution	<u>Acidic solution</u>	<u>Neutral solution</u>	<u>Alkaline solution</u>
Effect on litmus strip	<u>Changes the colour of blue litmus strip to red</u>	<u>Does not change the colours of red and blue litmus strips</u>	<u>Changes the colour of red litmus strip to blue</u>
Electrical conductivity	<u>Good electrical conductor</u>		

22) potential energy and kinetic energy.

PE → Stored energy due to position.

KE → Energy due to motion.

23) compare between producer ,consumer and decomposers in term of definition ,examples

Unit 3

Points of comparison	Producers	Consumers	Decomposers
Definition	<u>Living organisms can make food through photosynthesis</u>	<u>living organisms cant make food and depend on another</u>	<u>living organisms get their food by decomposing</u>

		living organisms	dead bodies
Examples	green plants green algae	animals Human	bacteria fungi

24) compare between herbivores ,carnivores , omnivores and scavengers in terms of definition ,examples

Points of comparison	Herbivores	Carnivores	Omnivores	Scavengers
Definition	plant eaters	meat eaters	feed on plants and animals	feed on remains of dead organisms
Examples	horse cow	lion tiger	bear mouse	Hyenas Eagle

25) Hereditary traits and acquired traits in terms of Definition – Examples

Heredity	Acquired
Traits transmitted from parents to offspring without learning Ex hair colour	Traits aren't transmitted from parents to offspring but it needs to learn Ex Child learning to walk

26) Acquired traits and instinctive behaviours in terms of Definition – Examples

Acquired traits	Instructive behaviour
Traits aren't transmitted from parents to offspring but it needs to learn Ex child learning to walk	from parents to offspring without Behaviour and traits are transmitted Learning Ex chicken laying on eggs

27) Spontaneous mutation and induced mutation in terms of: Definition – Examples

	Spontaneous Mutation:	Induced Mutation:
	Mutation that occurs naturally without human intervention.	Mutation that occurs due to human intervention.
Example:	Albino Child.	improve crops seedless or featherless chickens.

28) Scavengers and omnivorous "in terms of type of food, example"

	Scavengers:	Omnivores:
	Feed on remains dead animals.	Feed on plants and animals.
Example:	Hynes / eagle.	Bear.

29) Predation and mutualism

	Predation:	Mutualism:
	One organism (predator) kills and eats another (prey).	Both organisms benefit from each other.
Example:	Cat and mouse.	Bees and flowers.

30) Sedimentary, metamorphic, and igneous rocks in terms of:

Unit 4

Examples - Method of formation.

	Igneous rocks	Sedimentary rocks	Metamorphic rocks
Way of formation	The solidification of lava on the Earth's surface or from the solidification of magma between the cracks and the layers of the Earth's crust	Transportation and sedimentation of rock fragments followed by the compaction and lithification of sediments over the years into layers forming cohesive rocks	The exposure of rocks located beneath the Earth's surface to pressure and heat without reaching their melting point
Examples	Granite. Gabbro Basalt. Pumice.	Sandstone Limestone. Claystone	Marble. Quartzite.

31) Plutonic igneous rocks and extrusive igneous rocks in terms of: Method of formation - Examples - Crystal size.

Comfrison	Plutonic igneous rocks	extrusive igneous rocks
Method of Formation	Magma Cools very slowly in the clacks and layers of Earth's crust	lava, Cools quickly on the surface of The Earth's crust
Eamples	Granite-Gabblo	Basalt - Pumice
Crystal size	large	small

32) Infiltration and surface runoff.

In filtration	Surface runoff
is the process of rainwater infiltrates into the ground and is stored as groundwater	is the process of rainwater flowing across the Earth's surface and into rivers, seas and lakes due to the effect of the Earth's gravity

33) Evaporation and transpiration.

Evaporation	Transpiration
The conversion of water from the liquid state to the gaseous state upon gaining heat at any temperature	The process by which plants lose water in the form of water vapor

34) Fill in the blanks in the following form, explaining the similarities and differences between the three types of rocks:

Difference	Examples of rocks	Similarity among them
1) Igneous rocks Formed from the cooling and solidification of magma (underground) or lava (on the surface).	Granite – Basalt	They are solid components forming the Earth's crust.
2) Sedimentary Rocks Formed by erosion, deposition, and cementation of sediments over long periods.	Sandstone – Limestone	They are part of the natural Rock Cycle.
3) Metamorphic rocks Formed from pre-existing rocks subjected to high heat and pressure.	Marble – Quartzite	They are composed of minerals and are part of the Earth's crust.

9

correct the following statement

Unit 3

- 1) Inherited traits are traits passed from offspring to parents

Inherited traits are passed from parents to offspring.

- 2) Brown eye color is an acquired trait

Brown eye color is an inherited trait.

- 3) The presence of a solid body structure covering the frog is an inherited trait

The presence of a solid body structure covering the _frog_ → Correct: _turtle_

- 4) Instinctive behaviors are passed from parents to offspring without learning

Instinctive behaviors_ are passed from parents to offspring without learning.
(Correct statement)

- 5) Acquired traits are not inherited and are acquired by humans from the environment

Acquired traits are not inherited and are acquired from the environment.
(Correct statement)

- 6) Breastfeeding is an acquired trait

Breastfeeding is an instinctive behaviour, not an acquired trait.

- 7) Genetic material is found in the cytoplasm of eukaryotes

Genetic material is found in the nucleus of eukaryotes.

- 8) Chromosomes are thread-like bodies found inside the nucleus in the bean Plant

Chromosomes are thread-like bodies found inside the nucleus in the bean plant. (Correct statement)

- 9) The chromosome is chemically composed of DNA and protein

Correct.

- 10) The nucleic acid is made up of small parts known as nucleotides

Correct.

- 11) Spontaneous mutation occurs without human intervention

Correct.

- 12) Production of featherless chickens is considered induced mutation

Correct.

- 13) Light skin color people living in cold regions due to beneficial mutations
Light skin color people living in cold regions due to beneficial mutations.
- 14) Production of cube-shaped watermelons from induced mutations
It is not a mutation (it's a mechanical technique using molds .
- 15) People who suffer from lactose intolerance experience cramps and nausea when they eat meat
People who suffer from lactose intolerance experience cramps and nausea when they drink milk.
- 16) Beneficial mutations cause the appearance of desirable traits
Beneficial mutations cause the appearance of desirable traits.
- 17) The chromosome consists of two threads, each of them called a chromatid.
The chromosome consists of two threads, each of them called a chromatid.
- 18) The number of chromosomes in human is 46 chromosomes and in corn plant is 32 chromosomes
The number of chromosomes in human is 46 chromosomes and in corn plant 20 chromosomes
-
- 19) Rocks are solid objects composed of only one mineral.
Rocks are composed of one or more minerals.
- 20) Rocks are classified into three types: sedimentary, igneous, and limestone.
Sedimentary, igneous and metamorphic.
- 21) Chemical changes alone cause geological processes in rocks.
Physical and chemical changes cause geological processes.
- 22) Weathering is the process of breaking down and fragmenting rocks.
Correct.
- 23) Mechanical weathering is the process of breaking down and fragmenting rocks without changing their chemical composition.
Correct.
- 24) Water freezing in rock cracks causes them to freeze.
Causes them to crack and break.
- 25) Chemical weathering is the process of breaking down and fragmenting rocks with a change in their properties.
Correct.
- 26) Yellowstone National Park is a good example of chemical weathering.
Correct.
- 27) Calcium carbonate powder is used in making casts for broken bones.
Correct.

10 Write the chemical formula for the following compounds

Unit 1

	Name	Formula
1	Hydrochloric acid	HCl
2	Hydrobromic acid	HBr
3	Sulphuric acid	H ₂ SO ₄
4	Phosphoric acid	H ₃ PO ₄
5	Nitric acid	HNO ₃
6	Potassium hydroxide	KOH
7	An atomic group consisting of three elements	HCO ₃
8	Nitrous acid	HNO ₂
9	Sodium chloride	NaCl
10	Calcium hydroxide	Ca(OH) ₂
11	Aluminum sulfate	Al ₂ (SO ₄) ₃
12	Potassium nitrate	KNO ₃
13	Sodium carbonate	Na ₂ CO ₃
14	Magnesium oxide	MgO
15	Calcium phosphate	Ca ₃ (PO ₄) ₂
16	Iron (III) chloride	FeCl ₃
17	Hydrogen sulfide	H ₂ S
18	Ammonium hydroxide	NH ₄ OH
19	Sulfuric acid	H ₂ SO ₄
20	Sulfur dioxide	SO ₂
21	Nitrogen monoxide	NO
22	Silver nitrate	AgNO ₃
23	Sodium sulfide	Na ₂ S
24	Aluminum oxide	Al ₂ O ₃
25	Sodium hydroxide	NaOH

11 What is the use(function) of each of the following

Unit 1

	Subject	Function / Use
1	Stomach acid	Helps in digestion of food
2	Litmus paper	Differentiates between acidic, alkaline and neutral substances
3	Graphite	Used in the manufacture of the dry cell
4	Bronze alloy	Used in the manufacture of jewellery, statues and medals
5	Recycling of elements	• Their percentages in the Earth's crust decreases • The difficulty of extracting them from their ores • The lower cost of recycling compared to extracting them from their ores

6	Lactic acid	Provides muscles with the necessary energy during their lack of oxygen during muscular effort
7	Magnesium milk	It is used as a temporary treatment to neutralize gastric hyperacidity
8	Sulfur and nitrogen oxides	Form acid rain
9	Acidic oxides	Form acids
10	Basic oxides	Form alkalis
11	Adding tin to copper	Bronze alloy formed
12	Adding calcium hydroxide to soil	A basic substance that treats the acidic soil
13	Universal guide	Provides an approximate measuring of the pH values for the solutions
14	pH meter	Determination of pH values for any solutions directly and accurately
15	Scientist Soren Sorensen	Developed the pH scale
16	Scientist Arrhenius	Classified the acid and alkali

12 various questions

Unit 1

1) Identify the damage caused by acid rain :

- A) Destruction of forests.
- B) Harming the aquatic organisms (which live in water).
- c) Corrosion of buildings.
- D) Health problems in the human respiratory system.

2) The value of the basic solution increases as the pH number approaches 14



a- Which substances are less acidic ? **milk**

and which are more acidic ? **gastric acid**

b- Which substances are less basic ? **egg**

Which are more basic ? **oven cleaner**

c- The colour of hydrangea flowers varies, where:

- They turn **red** in alkaline soil, and **blue** in acidic soil.



3) Physical properties of salts :

Salts differs from each other in :

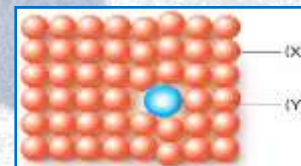
Color	White	Zinc sulphate ZnSO_4 , Sodium carbonate Na_2CO_3
	Blue	Copper sulphate CuSO_4
	Green	Nickel chloride NiCl_2
Solubility in water	Soluble salt	All salts (Sodium - Potassium - Ammonium - Nitrate) Copper sulphate - Nickel chloride
	insoluble	All carbonate salts except (Sodium - Potassium - Ammonium) Silver chloride AgCl - Calcium carbonate CaSO_4
pH value	Acidity	Ammonium chloride NH_4Cl $\text{pH} \leq 7$
	Alkalinity	Sodium carbonate solution Na_2CO_3 $\text{pH} \geq 7$
	Neutral	Sodium chloride NaCl $\text{pH} = 7$
Electricity	Solid salts don't conduct electricity	
	Salt solutions and its molten are good conductors of electricity.	

The salinity of dead sea is **10 times** higher than that of the red sea, and therefore its density **increase** (no object can sink in it)

4) The opposite figure illustrates the composition of the bronze alloy:

(1) What are the elements (X) and (Y)?

- Element (X): Copper.
- Element (Y): Tin.



(2) Why are alloys preferred to be used more than the pure metals?

Because alloys are harder than pure metals, which tend to be soft and often unfit for the industrial uses and resistance to rust.

5) Can the type of potassium hydroxide solution be identified by using the blue litmus strip? Explain.

No / Because potassium hydroxide solution is an alkaline solution that does not change the colour of blue litmus strip.

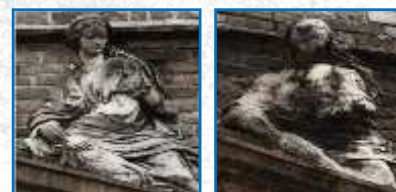
6) Element (X) oxide has the following properties:

- ❖ It can react with acids.
- ❖ It does not react with alkalis.

Is element (X) sulphur or copper? Explain.

Element (X) is copper / Because copper oxide is a basic oxide that reacts with acids and does not react with alkalis.

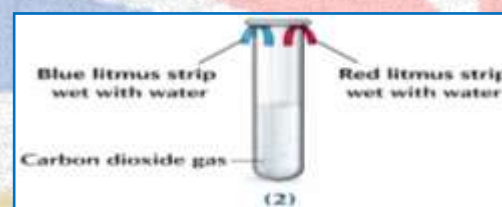
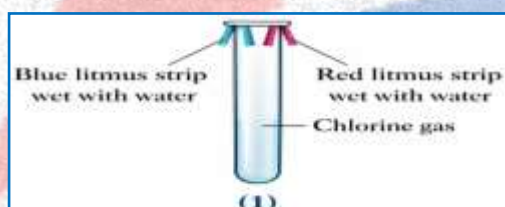
- 7) The opposite figures show the same statue left in open air for nearly 100 years :



Why did the details of the statue disappear according to what you have studied?

Due to acid rains which result from the dissolution of acidic oxides in atmospheric water vapour.

- 8) What happens to the colours of the litmus strips in the following cases?



❖ In case of tube (1): Chlorine gas removes the colour of the two litmus strips.

❖ In case of tube (2): The blue litmus strip turns red.

- 9) Acidity of the soil varies from one place to another:

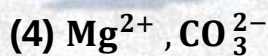
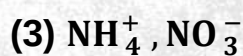
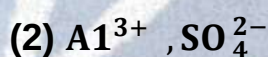
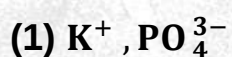
(1) How can acidic soil be treated?

Acidic soil is treated by adding basic substances to it, such as calcium hydroxide $\text{Ca}(\text{OH})_2$

(2) What is the colour of Hydrangea flowers which grow in acidic soil?

The flowers acquire blue colour.

- 10) Write the molecular formulas of the salts composed from the following cations and anions:

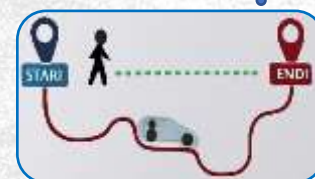


Answers:



- 11) look at the following figure then answer :

- The path taken by the car represents **distance**
- The path taken by the person represents **displacement**



- The measuring unit for the physical quantity represented by the path of the car is **m , cm or km**

12) Complete the figure :

- Speed is defined as **the distance covered per unit time**

Speed is measured in units of **m/s or km/h**

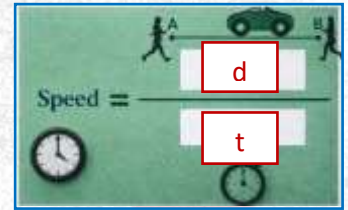
- Calculate the speed of an object that covers distance of 10m in a time of 5s.

$$\text{Speed} = \text{distances} \div \text{time} = 10/5 = 2 \text{ m/s}$$

- When is the distance covered equal to the displacement ?

if move in straight line in one direction

- When is the speed equal to the distance covered ? **if time equal 1 second**

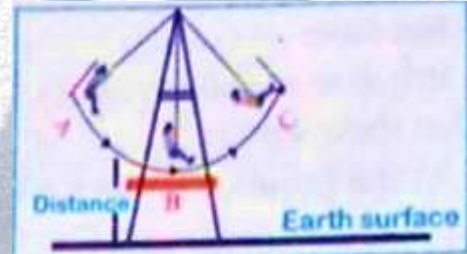
**13) From the forms of the potential energy:**

- 4- **Gravitational** potential energy like **a rock on top of a hill / a ball held at a height**
- 5- **Elastic** potential energy like **a compressed spring / a stretched rubber**
- 6- **Chemical** potential energy like **food / fuel / batteries**

14) Look at the figure in front of you:

- 1- The reference point (rest position) of the swing **Reference point → Position B.**

- 2- At what position is the potential energy is greatest?



Explain **PE is greatest → At positions A and C (highest points).**

- 3- At what position the potential energy equal to zero ? **PE = zero → At the earth's surface (reference level).**

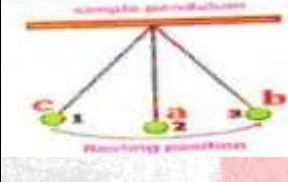
- 4- At what position the kinetic energy greatest ?

Explain **KE is greatest → At position B (lowest point).**

- 5- At what position the kinetic energy equal to zero? **KE = zero → At positions A and C.**

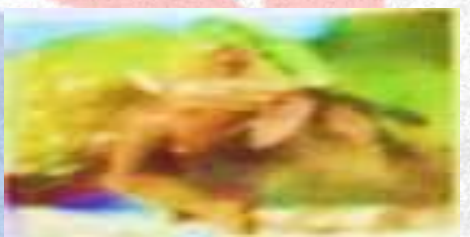
- 6- The sum of the potential and kinetic energies = **Sum of PE and KE → Mechanical Energy (Constant).**

15) Energy transformations in a simple pendulum

Body energy	At the point (c,b) maximum height		At the resting position
P.E	Max		Min
K.E	Zero		Max.

16) Notice the following pictures then determine the predator and prey

Unit 3

		
Insect is a prey Plant is a predator	Zebra is a prey Lion is a predator	Lizard is a prey Snake is a predator

17) Notice the following picture then complete:

- The picture represents the **competition relationship between two lions on prey.**
- In this relationship both individuals are **harmed.**



18) Notice the following picture then complete:

- The picture represents the **mutualism relationship** Between **nodular bacteria** and **leguminous plants.**



- **been plant** obtain nitrogenous materials from **air** which fix nitrogen from the air to build **proteins**, while **bacteria** obtain their food from plant as a result of the process of **photosynthesis.**

19) Notice the following picture then complete:

- The image represents the **commensalism** relationship between **Egyptian plover bird** and **Nile crocodile**.
- The **plover bird** benefits by feeding on leftover food that get trapped between the crocodile's teeth, While the **crocodile** neither benefits nor is harmed.



20) Notice the following figure then complete:

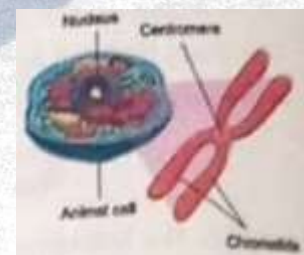
- The image represents **marine** food chain.
- The **algae** represents a producer.
- The **copepod** represents a primary consumer.
- The **fish** represents a secondary consumer.
- The **Seal** represents a tertiary consumer.
- The energy flow in this food chain is expressed as follows:



21) Structure of chromosomes

Notice the opposite figure then complete:

- Each chromosome consist of two threads, each called **chromatids**, and connected at a central point known as **called the centromere**.



22) The chemical structure of DNA

Notice the opposite figure then complete:

- The chromosomes composed of **a nucleic acid called DNA**, abbreviated as **around proteins**, wrapped around a type of protein known as **histones**
- The nucleic acid DNA is made up of small segments called **genes**, they are responsible for appearance of **hereditary traits**.



- Each gene consists of a sequence of smaller building units known as **nucleotides arranged** which exist in the form of two strands twisted around each other, forming what is known as **the double helix**

23) Which of these organisms is an omnivores, scavengers, herbivores, or camisoles?

Figure 1 (Vulture): Scavenger

Figure 2 (Horse): Herbivore

Figure 3 (Bear): Omnivore

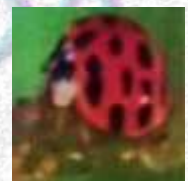
Figure 4 (Lion): Carnivore

24) Compare between the lion and the horse in terms of: type of food, shape of teeth.

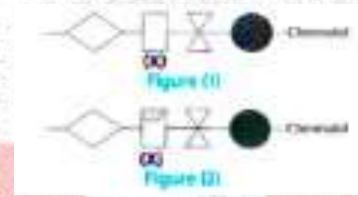
			
1 (Vulture): Scavenger	2 (Horse): Herbivore Type of food → Grass Teeth → Flat broad teeth for grinding plants	3 (Bear): Omnivore	4 (Lion): Carnivore Type of food → Meat Teeth → Sharp canines for tearing flesh

25) Answer the following questions:

- What is the name of this organism? **Ladybug**
- What organisms does it feed on? **Small insects like aphids**
- Mention its benefits for the environment? **Biological control that protects crops from pests without using chemicals**



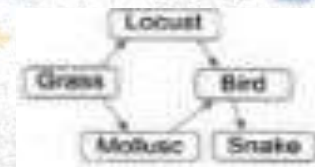
- 26) The illustrative figure (1) represents a part of a chromosome in the body of a woman and the illustrative figure (2) represents the same chromosome in another cell in the body of the same woman: (1) What is the term used for part (X) of the chromatid ? **Gene.**



- (2) What is the term used to describe the change occurring in part (X) in figure (2) ? **Mutation.**

- 27) In the opposite food web:

- (1) How many food chains do make up this web ? **2**
- (2) Complete: To reduce the number of molluscs, it is necessary to increase the number of **Birds** and reduce the number of **Grass**.

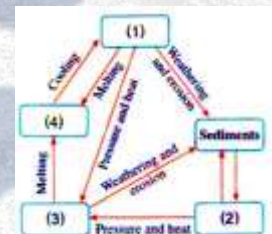


- 28) The opposite model instates the rock cycle:

Unit 4

Replace the numbers from (1): (4] with the appropriate terms from the following

- (1) Sedimentary rocks **Igneous rocks.**
- (2) Igneous rocks **Sedimentary rocks.**
- (3) Metamorphic rocks **Metamorphic rocks.**
- (4) Magma. **Magma**



مفیش وقت للأنهيار
ذاكر وأنت بتعيط.



كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



خطوة 1



خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6